THE PRACTICAL TEACHER

With which is incorporated

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"It is to be noted that when any part of this paper appears dull, there is a design in it."—*Steele.*

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Continuation Classes in Glasgow.

BY HENRY DYER, C.E., M.A., D.SC., LL.D.,
CONVENER OF THE CONTINUATION CLASSES COMMITTEE OF THE SCHOOL BOARD OF GLASGOW.

IN the organisation of Continuation Classes in any part of the country it must always be kept in mind that they should not be looked upon as things by themselves, but as forming an essential part of the national system of education, and therefore, of course, in organic connection with it. That connection, however, must be sufficiently elastic to allow it to meet the requirements of all classes of the community. It is, for instance, absurd to start with the assumption that *all* the scholars leaving the elementary schools will proceed to a higher or what is now called a Central Institution, and that a curriculum extending from the infant department to that required by the diploma of a college or the degree of a university can be cut into sections, the various parts of which will represent what is necessary for the different grades and classes of students. In the early days of School Boards, in almost all the elementary schools, a considerable number of specific subjects were taught, in the hope that many of the scholars would proceed to the highest departments. That system has now been abandoned as absurd from an educational point of view, and wasteful from a financial point of view; and the elementary schools are rounded off by what are called supplementary classes, in which the simpler applications to daily life are given. The more promising scholars are, as a rule, moved from the elementary schools before they reach the supplementary classes, and enter the higher-grade or secondary schools, where they can follow out a course of a systematic nature.

The fundamental mistake of all education which forms part of a large system is the tendency to uniformity of curriculum and methods of education for all the scholars, who differ greatly not only in ability but also in opportunity. Of course, in a national system it is impossible to have ideally perfect arrangements to meet the requirements of all classes of students; still there should be as much elasticity as possible. As Professor Paulsen put it: "The ideal of a true national education would not be an equal education for all, but rather a maximum of individual development, corresponding to the infinite variety of tasks, of powers, and of gifts produced by the creative forces of Nature, on the basis of a homogeneous education of the whole people, forming part in its turn of the universal education of mankind, conceived as an organic whole. And the ideal of a national educational system would be an organisation giving every single individual a chance to attain to a maximum of personal culture and social efficiency according to his natural gifts and the strength of his will." A large proportion of the scholars in every elementary school (estimated by some headmasters at about a third of the whole) should not be expected or required to go beyond the three R's, and the instruction in these should be made as complete as possible, and no attempt should be made to force all the scholars through the details of a uniform curriculum. We often hear complaints about the curriculum of the elementary schools being overloaded, but that impression arises from the fact that it is not used in a rational manner. In his latest report on education in Scotland, the Secretary of the Education Department says that "for practical purposes reading, writing, and arithmetic may be taken to be the main subjects of instruction in the primary school curriculum. All the others are to be regarded as *auxiliary* —that is, they are valuable for the discipline they afford, and the variety of means they offer for exercising the intelligence of the children, rather than for the amount of positive knowledge or of proficiency acquired, even although that may not be inconsiderable." No doubt some of the teachers will say that if these ideas are to be carried out there must be a different method of inspection and examination from what at present prevails; and it would be well if Sir John Struthers tried to impress his opinions on his representatives, for so long as the details of the various subjects are asked for, so long will the teachers continue to give them to all the scholars, and so long will the results be very unsatisfactory from an educational point of view.

The Continuation Classes should be co-ordinated with the elementary and the higher-grade schools on the one hand, and, on the other, with the Central Institutions, such as the Technical College, the School of Art, and the Athenæum, or other similar institutions; and in Glasgow such a co-ordination is being gradually carried out. It is, however, necessary to have a more definite idea of the educational standard to be aimed at for entrance to a Central Institution before the results can be satisfactory. The scholars who have only been to an elementary school and those who have been wholly or partially through the curriculum of a higher-grade school are in very dissimilar educational conditions, and classes in elementary mathematics and drawing are in themselves not sufficient to bring the former up to the same standard as the latter. The course for the Intermediate Certificate seems a reasonable standard to expect of all who enter the regular curricula of Central Institutions. In Glasgow we have arranged in certain higher-grade day schools to include the geometrical and mechanical drawing required for entrance to the Technical College, and to omit one of the modern languages. This, as a rule, can be taken by boys who remain at school till their sixteenth year; and it is to be hoped that before long the great majority of those who intend to follow engineering or trades of a mechanical nature, in which a five years' apprenticeship is required, will take that course, and be able to

proceed direct to the first-year course of the Technical College, or to an equivalent course in the Continuation Schools. Those who leave school at fourteen very often drift about for a few years, and forget a great deal of what they have learned in the day classes. The secondary education committees now give bursaries very freely, and those who require assistance can get it from this source. Many boys of the better working-class families would take such a course if they knew that it saved them much time in the Continuation Classes. At the same time, arrangements have been made which will enable those who had only been to an elementary school to approximate at least to the science subjects of the intermediate course, including elementary mechanics and physics, so that when they enter the Technical College they may be able to follow the work with intelligence. In his latest circular the Secretary of the Education Department says that the Department proposes in future, with the assistance of teachers and managers, to obtain information as to the occupations on which pupils enter when they leave school, and to maintain this record, as far as possible, up to the age of seventeen. It is to be hoped that a similar record will be kept of those who enter the Central Institutions up to, say, the age of twenty-one. Personal contact with the students would show that in many cases they were unable to continue their studies, because of long hours of work during the day, imperfect preparation in certain preliminary subjects, and want of personal assistance, which is impossible in the large classes, which are still too common. Quality of work done and not mere number of students is what should be aimed at in the Central Institutions.

Those students who have gone through the Intermediate Certificate curriculum in a higher-grade school, or approximated to it by classes in the evening schools, are able to do justice to the work of the first year of the Technical College or other Central Institution, in which they will find courses of study suited to the requirements of the different trades. In the Glasgow and West of Scotland Technical College the following courses have been arranged:—(1) Mechanical engineering, (2) electrical engineering, (3) civil engineering, (4) mining, (5) naval architecture, (6) building construction, (7) mathematics and physics, (8) chemistry, (9) metallurgy, (10) biology, (11) textile manufacture. There are, in addition, courses in practical trade subjects, such as—(1) Plumbing, (2) sheet-metal work, (3) baking, (4) printing and allied trades, (5) bootmaking, (6) watch and clock making, (7) tailoring, and others. The entrance examination required for the longer and higher courses is not demanded of those who enter the trades classes, but they are expected to have the education necessary to enable them to follow the work of the classes in an intelligent manner. These courses prepare fairly well for all the ordinary occupations. Those who aim higher and have the necessary ability take the day classes, and provision is made for the best students in the evening classes to attend the day classes without payment of fees. Those who hold the diploma of the Technical College may proceed to the university, and after attending one year may take a degree in science, and this has been done by not a few of the best students. We have thus what Professor Huxley called an educational ladder, which is fairly complete.

It is evident, however, that only a very small proportion of the scholars who leave the elementary schools will ever proceed to a Central Institution, and especially to those classes requiring a fairly high standard of general education; and it is most desirable that provision of a simpler kind be made for those who are unable to take the longer courses. The importance of attention to the further education of adolescents is now being recognised by educationists and social reformers; and in Circular 426 of the Education Department the subject is dwelt upon at considerable length, and it is pointed out that it is broadly true that while School Boards, as such, have hitherto stood in no sort of relation to young persons over fourteen years of age, or had any responsibility for providing for the educational needs of adolescents, it is becoming increasingly clear that a national system of education founded on such principles can be at best but a qualified success. The Education (Scotland) Act, 1908, gives power to School Boards to make by-laws compelling attendance at Continuation Classes between the ages of fourteen and seventeen, and the Secretary of the Education Department remarks that "it will probably be regarded as a source of legitimate satisfaction by the School Boards and people of Scotland, and as a tribute to the soundness and efficiency of Scottish educational traditions, that the legislature has seen fit to permit this momentous experiment to be made first of all in that portion of the United Kingdom. It has further shown its confidence in the School Boards of Scotland by entrusting them with the discretionary use of the very comprehensive powers conferred by the third subsection of Section X. of the Act—a confidence which will doubtless be justified by experience of the use which School Boards make of these powers, and by their discharge of all the responsibilities placed upon them by the recent Act in this connection."

The subject of compulsion in connection with Continuation Classes involves many difficult problems of an educational and social nature into which I cannot at present enter; and while I should like to see all boys continue their education in a more or less systematic manner till they are twenty-one years of age, I agree with the opinions expressed by Lord Pentland in a letter to the Chairman of the Edinburgh School Board, in which he said: "School Boards should not confine themselves to purely official action in this matter. They would be well advised to endeavour to enlist the interest and sympathy of as many people as possible. These are truly social purposes and endeavours, and should receive the help and encouragement of all, as they are now doing in Edinburgh. If this is done, the question of compulsion is probably

not very urgent. It will not come up for consideration until all that is reasonably possible under a voluntary system has been done."

In Glasgow we have now arranged for classes for artisans who on account of lack of time or ability are unable to proceed to one of the courses leading to the Technical College. During the first two years the work of the industrial course of the day schools will be continued, especially in English, citizenship, technical arithmetic, mechanics, and drawing; and in the third year the simpler applications of these science subjects will be shown to the special trades or occupations in which the students are engaged. Classes have been established for the following among others :—

1. Artisans in various departments of mechanical engineering.
2. Artisans in various departments of shipbuilding.
3. Patternmakers and moulders.
4. Boilermakers.
5. Electrical instrument makers.
6. Carpenters and joiners.
7. Masons and builders.

One of the chief duties of the teachers will be to note the most promising students in these classes, and encourage them to enter the courses leading to the Technical College; and, on the other hand, those students who begin these courses and find that they are unable to continue should be encouraged to take up the practical applications to their trades. At present there is a great wastage among the students, which would be prevented if a little personal attention were given to them, and suitable courses of study provided.

I have confined myself chiefly to the classes intended for artisans, but we have now very complete arrangements for courses in English, languages (classical and modern), commerce, domestic science, art, and decorative trades; and what has been said about the courses for artisans applies for the most part to these courses. Those who are specially interested in education may obtain copies of the prospectus and guide issued by the School Board by applying to the Clerk, 16 Royal Exchange Square, Glasgow.

The true test of education is the desire which has been implanted in the students for further study. Every encouragement should be given to this desire by the teachers, so that after the scholars leave the classes they may to a greater or less extent continue their study. Such an organisation as the International Correspondence Schools is very useful to private students. Its work is organised on educational lines, and carried out with great ability and thoroughness, and it forms a valuable supplement to the national system of education. It now has branches in many parts of the country, and has been largely taken advantage of by students who are unable to attend the ordinary classes, or who wish to continue their studies in special departments.

In the new Education Act special emphasis is put on the duty of making provision for instruction in the laws of health and affording suitable opportunities for physical training, and the Education Department has recently been emphasising the importance of instruction in the duties of citizenship, a subject which is at present very much neglected. These subjects, and the social problems involved in them, open up a very wide field for the enthusiastic and intelligent work of School Boards, and of all interested in education and social welfare.

Edinburgh School Board Educational Information and Employment Bureau.

(*Continued from page 197.*)

AMONG the suggestions made by individual members of the Advisory and Selection Committees, the following may be noted :—

1. That there be got from each organised trade the number of persons employed in the trade, the probable number of vacancies, and the number of apprentices required to fill these from year to year.
2. That the representatives of the various trades should from time to time make known to the School Board their educational requirements.
3. That the chief object of the Bureau should be to see that lads and girls are suited for the occupation they enter.
4. That alongside of apprenticeship there should, where practicable, be given technical instruction during the day.
5. That the Bureau should be careful not to encourage too many apprentices to enter any trade.
6. That there be formed Sub-Committees, whose duty it would be to give advice regarding suitable educational courses for groups of allied trades.
7. That the Bureau keep in touch with, and, if the Committee think advisable, supply information to, any District Committees already formed, or which may be formed, to interview and advise parents who require special aid in placing their children in suitable occupations.
8. That the Bureau keep in close touch with the Government Labour Exchanges.
9. That further effort be made to have the by-laws regarding street trading enforced.
10. That the School Board should consider whether training in crafts could not be best given in compulsory technical classes held during the day.

In order that members of the Council should have a fairly comprehensive knowledge of the system of continuation work as at present established in the city, a series of twenty-six visits was arranged to the Continuation Classes, the Heriot-Watt College, and the College of Art. The visiting members were asked to give short reports of their impressions, criticisms, and

suggestions. Summaries of these reports have been printed and circulated among members of the Board, employers, and teachers. Some of the suggestions were exceedingly valuable, and the Board have decided to give practical effect to them in the arrangements for the next session of the Continuation Classes.

It is, apparently, the School Board's intention to do all in their power to associate the employers with them in the work of the Bureau. The director of the Bureau keeps himself in touch with the employers by means of an annual visitation in his capacity as organiser of the Continuation Classes. This visitation takes place immediately before the opening of the winter session, in September and October. Last year, in all 571 calls were made, and the number of individual employers interviewed was considerably over 500. The following table shows the number of visits, the number of meetings of workpeople, and the total enrolment in each year since the Board's policy of approaching employers was instituted.

Session.	Visits.	Meetings of Workers.	Enrolment.
1905–6	—	—	3,772
1906–7	350	2	4,516
1907–8	495	30	6,477
1908–9	542	56	7,621
1909–10	571	81	8,789

Each year all the chief employers are called on, and an effort is made to break fresh ground so far as the smaller shopkeepers and less important business people are concerned. Little or no difficulty is now experienced in arranging meetings of workpeople. Many employers, as soon as they are notified that the Board's organiser proposes to call on them, write offering dates and suggesting arrangements for a meeting. The workers themselves appear to look forward to such meetings, and it is no uncommon feature for one or two of the men to proffer criticisms and suggestions. It should be stated that an attempt is always made to secure that the head of the firm or a responsible representative shall preside; that the meeting shall be held inside the gates of the work—under cover, if possible, and partly in the employer's time. It speaks volumes for the employers' interest that these three conditions are generally complied with. Occasionally, for very valid reasons, the third is refused; on the other hand, it is worth noting that in a considerable number of cases the employers have stopped their works twenty or thirty minutes before the usual hour of dismissal, in order that all the employees should be present, and that the member of the Board who was to speak should have an opportunity of doing so free from a sense of hurry and undisturbed by the noise of machinery.

The meetings, as a rule, do not occupy more than twelve or fifteen minutes; but occasionally, when unusual interest has been evinced, the proceedings have been prolonged beyond that time at the request of the employers and workers. The procedure consists of a few introductory remarks by the chairman, a short address of five minutes' duration by a member of the Board, and a brief description by the organiser of the classes related to the industry or occupation of the workers.

Such functions have a value beyond their more immediate purpose of making the Continuation Class system widely known. They bring employers, workpeople, educational representatives, and officials together on a common platform, to consider what steps can be taken to improve the efficiency of the industrial population. They deepen the sense of national and civic responsibility on the part both of parents and of young people, and so may have a very important bearing upon the standard of duty of the next generation.

The Extent to which the Bureau has been Used.

In the latest statement by the director regarding the work of the Bureau we learn that—

1. The number of pupils reported as leaving school and concerning whom Bureau cards have been received during the past year is 2,312
2. Number of above who have stated their intention to enrol in Continuation Classes . 1,529
3. Number of above 2,312 who have made personal application to the Bureau for employment 590
4. Number who have entered on an occupation 440
5. Number of applications for advice regarding education and employment may be put down at 800

Employers are more and more realising that reference to the records kept in the Bureau concerning boys and girls who have left school is specially helpful to them in selecting suitable workers. Already 239 employers have utilised the services of the Bureau. It is interesting to note that, of the 440 children placed by the Bureau, 263 have been apprenticed, 74 have entered on office work, 29 are learning to be shop assistants, 59 are engaged in temporary work, and 15 in miscellaneous employments.

Relationship of Bureau to Board of Trade Labour Exchange.

At the present time the question of co-operation between Bureaus established by educational authorities in England and Scotland and the Labour Exchanges of the Board of Trade has been exercising the minds of all interested in the conditions of juvenile employment.

Some very hard things have been said by the extremists on both sides, and too seldom has there been any disposition to weigh up carefully the facts of the case with a view to arriving at a clear conception of the respective duties and functions of the two organisations.

A memorandum on the subject has recently been prepared by the Clerk to the Edinburgh School Board. In terse and lucid terms he sets forth the functions of a juvenile employment organisation as follows:—

1. Advice to juveniles as to the pursuits for which they are by ability, taste, character, and education suited.

2. Advice to juveniles as to the opportunities which exist in the various occupations.

3. Collection and promulgation of general information in regard to industrial conditions.

4. Registration—that is, bringing into contact the employer with a specific position to offer and the juvenile suited for and desiring such a position.

5. The supervision, in certain cases, of the juvenile after he has obtained employment, so that he is induced to take advantage of all educational facilities pertinent to his work, and is advised as to the various steps in his industrial career.

6. The keeping of the system of further education in real touch with the industrial needs of the locality.

The clerk says that it will readily be admitted that in regard to Nos. 1, 5, and 6 the Education Authority should be the responsible body. On the other hand, No. 3 should be the duty of the Labour Exchange. Doubt arises in the case of Nos. 2 and 4. In the case of the former, the balance of argument, he clearly shows, lies with the Education Authority, especially if it is borne in mind that juvenile labour must not be considered merely as an economic asset to be moved wherever demand arises. In regard to No. 4, a compromise is suggested. It is proposed that the registration clerk and machinery should remain part of the organisation of the Labour Exchange, but should be housed in the same office as that of the Educational Authority's Education Information Bureau. Close co-operation would thus be established, and parents and employers would be enabled to deal in one office with all the parts of the problem of juvenile employment.

These proposals are at present under the consideration of the Scotch Education Department and the Board of Trade. No better solution of a difficult problem is likely to be forthcoming, and it is to be hoped that in both England and Scotland the basis of a practical working arrangement they contain will be generally adopted.

In a circular letter issued on August 10, 1910, to School Boards on the subject of Employment Agencies, Sir John Struthers, Secretary to the Scotch Education Department, points out that the primary functions of the Labour Exchange are to bring employees and those seeking employment into contact with one another, and to study the conditions of employment in the districts in which they are established; while the function of Educational Information and Employment Bureaus is much wider, and concerns all the older pupils in the schools. The School Board agency would have special facilities, he remarks, for offering guidance to young people who might otherwise drift into casual and "blind alley" occupations, and would make arrangements for the supervision, by means of voluntary workers, of the young persons leaving school for employment in their district. In the circular it is suggested that the various School Boards should make local working arrangements with the Labour Exchanges, and should forward these to the Education Department.

Apparently the Education Department and the Board of Trade are now acting in harmony, and there is therefore good reason to expect within the near future rapid progress in the general establishment of special agencies under the Education Authority for the collection and distribution of information as to employments open to children on leaving school.

Religion, Morals, and Manners.

A COURSE OF BIBLE TEACHING FOR THE SCHOOL AND HOME.

BY J. EATON FEASEY, HEADMASTER OF THE RANMOOR SCHOOL, SHEFFIELD (UNIVERSITY DEMONSTRATION SCHOOL), A LECTURER IN EDUCATION IN THE UNIVERSITY OF SHEFFIELD, AUTHOR OF "IN THE OPEN AIR," "IN THE GARDEN," ETC.

INTRODUCTION.

THE controversies concerning religious education in public schools have forced all serious people to consider not only whether it is desirable that Biblical instruction should be given there, but also how the Bible should be used for the purposes of such instruction, not only there, but in Sunday schools and in the home.

By universal consent the formation and strengthening of character is the great function of all schools and the great duty of all parents. Moreover, it is agreed that definite instruction in morals and religion must be given. To the writer it seems that for this purpose the Bible, with the divine sanctions and authority behind it, is indispensable. There is no basis for morality without God. To quote Dr. Fitchett: "Unbelief, since it rejects all divine sanction and cancels God as a force out of human life, has no basis for morals." If we have no vision of an eternal righteousness which requires us to be righteous, we have no basis for ethics, and so none for moral instruction. There is, however, a strong movement in certain quarters to dissociate moral instruction in schools from religion and the Bible. Indeed, it is disputed whether one can give moral instruction with the Bible as one's great text-book. A very well-known writer and teacher has asserted that "one cannot teach a love of animals or the dignity of human labour from the Bible." Certain chapters in this course give the direct negative to that statement. The writer holds that the Bible is emphatically the best text-book of morals, and a perfect treasury of illustrations for teaching morals. Also, it is obvious that the teacher has a tremendous advantage who can, and does, fall back on the authority of God as arbiter of conduct.

It may be doubted whether the best method of using the Bible is always adopted. Schools are often much more concerned with giving what is called "exact knowledge" of the contents of the Bible than with the lessons for life and rules for conduct which the Book affords. To inform a child as to the exact length of a "Sabbath day's journey" when expressed in English miles is not so important as to teach him to value the Sabbath. One may explain exactly who the Levite, the priest, and the Samaritan were, the present-day value of the "two pence" given to the innkeeper, and the geography of the road from Jerusalem to Jericho, and say nothing whatever of the real point of the great parable. In the following course of lessons the suggestion is made that the teacher should first of all determine what it is that he wishes to teach. The usual plan adopted in Sunday schools is to take a chapter or portion, read it through with the scholars, and then extract what lessons one can from the portion. Surely it would often be better if the teacher first felt a desire to drive home some great truth, and then selected his Bible readings to that end. This is the method here illustrated. A large number of subjects may be treated in the same way. An attempt is also made here to show the use of English literature in illustration of such lessons.

It is not suggested that the subjects here treated are of the first importance in religious education. Some will think of them as "minor moralities." But they are subjects upon which the young especially need

definite positive teaching; and the method here adopted may be applied to other subjects upon which it is desired to give instruction.

Lesson 1.

OUR ATTITUDE TO THE DISTRESSED.

Abou Ben Adhem (may his tribe increase!)
Awoke one night from a deep dream of peace,
And saw within the moonlight in his room,
Making it rich and like a lily in bloom,
An angel, writing in a book of gold.
Exceeding peace had made Ben Adhem bold,
And to the presence in the room he said,
"What writest thou?"—The vision raised its head,
And, with a look made of all sweet accord,
Answered, "The names of those who love the Lord."
"And is mine one?" said Abou. "Nay, not so,"
Replied the angel. Abou spoke more low,
But cheerily still, and said, "I pray thee, then,
Write me as one that loves his fellow-men."
The angel wrote, and vanished. The next night
It came again with a great wakening light,
And showed the names whom love of God had blessed,
And lo! Ben Adhem's name led all the rest.

LEIGH HUNT.

In a certain Yorkshire village there were two barbers. One had his shop at one end of the village street, and the other at the other end. One barber fell ill on a Wednesday, and was unable to work for that week. The other noticed a large increase in his business during the week, and on inquiring discovered that the cause was that the illness of his rival had driven customers to him. He had, of course, quite properly earned all he had received. After closing his shop, however, on the Saturday night he deducted from his week's takings the amount he usually earned in a week, and the remainder he took on Sunday morning to his sick business rival.

At another place in Yorkshire, in a period of bad trade, hands were being discharged weekly from one of the great factories. Among those to be thrown out one Saturday was a man with a sickly wife and five small children. Another man, working in the same shop and knowing all the circumstances, was not discharged. Possibly he was a better workman, and so kept his place. He was, however, unmarried, and had no one dependent upon him. Seeing the distress of the discharged man, he went to the manager, and quietly asked if he could not be discharged and the other given his post. He pointed out all the circumstances, and begged that for the sake of the other's children the exchange should be made; and this was actually done.

These are true stories of to-day. They illustrate vividly what every Christian recognises as the proper attitude for one to take toward his neighbour in distress. We feel instinctively that the action of each of these men has something noble and generous and admirable about it. But from whence does this feeling spring? Is there any *compulsion* to act in this way? Is a Christian called upon to make sacrifices for those in distress? Certain it is that the ancient morality was founded on universal selfishness. In Plato's *Republic*, the ideal state of the loftiest Greek morality, the doctors were advised to neglect their patients among the sick poor, because the life of a poor man was regarded as an evil when he was no longer able to do the drudgery of life. We shrink from such an attitude, and we turn with admiration to the story, for example, of Father Damien, the young priest who sacrificed everything and gave himself to live and die amidst the loathsome leprosy of Molokai.

But apart altogether from the heroic and great, how ought we to bear ourselves towards the poor, the sick, the sad, and the lonely whom we meet in our ordinary daily life? What does the Bible teach on these things? and particularly, what is the line of action enjoined by Jesus Christ, the great Teacher?

One great doctrine stands out prominently in every book of the Bible, and rings out from almost every chapter. It is this: That the man who shall take advantage of his neighbour's misfortune, the man who shall oppress the poor and needy, is accursed before God. The Lord is the Helper, the Protector, the great Friend of the poor, the needy, the sick, and the unfortunate. His ear is always open to their cry, and swift and terrible, say the poet, the legislator, and the prophet, shall be His dealings with those who oppress the distressed.

The following are merely samples of what may be found throughout the Scriptures:—

"Thus saith the Lord; For three transgressions of Israel, and for four, I will not turn away the punishment thereof; because they sold the righteous for silver, and the poor for a pair of shoes; that pant after the dust of the earth on the head of the poor, and turn aside the way of the meek" (Amos ii. 6, 7).

"Forasmuch therefore as your treading is upon the poor, and ye take from him burdens of wheat: ye have built houses of hewn stone, but ye shall not dwell in them; ye have planted pleasant vineyards, but ye shall not drink wine of them. For I know your manifold transgressions and your mighty sins: they afflict the just, they take a bribe, and they turn aside the poor in the gate from their right" (Amos v. 11, 12).

"When the poor and needy seek water, and there is none, and their tongue faileth for thirst, I the Lord will hear them, I the God of Israel will not forsake them. I will open rivers in high places, and fountains in the midst of the valleys: I will make the wilderness a pool of water, and the dry land springs of water. I will plant in the wilderness the cedar, the shittah tree, and the myrtle, and the oil tree; I will set in the desert the fir tree, and the pine, and the box tree together: that they may see, and know, and consider, and understand together, that the hand of the Lord hath done this, and the Holy One of Israel hath created it" (Isa. xli. 17-20).

"If thou seest the oppression of the poor, and violent perverting of judgment and justice in a province, marvel not at the matter: for he that is higher than the highest regardeth; and there be higher than they" (Eccles. v. 8).

"And the word of the Lord came unto Zechariah, saying, Thus speaketh the Lord of hosts, saying, Execute true judgment, and show mercy and compassions every man to his brother: and oppress not the widow, nor the fatherless, the stranger, nor the poor; and let none of you imagine evil against his brother in your heart. But they refused to hearken, and pulled away the shoulder, and stopped their ears, that they should not hear. Yea, they made their hearts as an adamant stone, lest they should hear the law, and the words which the Lord of hosts hath sent in his spirit by the former prophets: therefore came a great wrath from the Lord of hosts" (Zech. vii. 8-12).

Nor is this all. Oppression of the poor, taking advantage of the trouble of others, is again and again denounced; but with not less vigour and authority, even in the Old Testament, is active care for and consideration of the distressed commanded. That a man should see the naked or hungry and not supply their needs as far as he was able to do so, or that a man should oppress the widow and fatherless, was considered an offence for which God would destroy one, even in the days of Job.

"If I have withheld the poor from their desire, or have caused the eyes of the widow to fail; or have eaten my morsel myself alone, and the fatherless hath not eaten thereof; . . . if I have seen any perish for want of clothing, or any poor without covering; if his loins have not blessed me, and if he were not warmed with the fleece of my sheep; if I have lifted up my hand against the fatherless, when I saw my help in the gate: then let mine arm fall from my shoulder blade, and mine arm be broken from the bone. For destruction from God was a terror

to me, and by reason of his highness I could not endure" (Job xxxi. 16-23).

The following are laws taken from the Mosaic code. They exhibit a spirit which would do honour to any legislature even in these Christian twentieth-century days :—

"When thou cuttest down thine harvest in thy field, and hast forgot a sheaf in the field, thou shalt not go again to fetch it: it shall be for the stranger, for the fatherless, and for the widow: that the Lord thy God may bless thee in all the work of thine hands. When thou beatest thine olive tree, thou shalt not go over the boughs again: it shall be for the stranger, for the fatherless, and for the widow. When thou gatherest the grapes of thy vineyard, thou shalt not glean it afterward: it shall be for the stranger, for the fatherless, and for the widow. And thou shalt remember that thou wast a bondman in the land of Egypt: therefore I command thee to do this thing" (Deut. xxiv. 19-22).

"And when ye reap the harvest of your land, thou shalt not wholly reap the corners of thy field, neither shalt thou gather the gleanings of thy harvest. And thou shalt not glean thy vineyard, neither shalt thou gather every grape of thy vineyard, thou shalt leave them for the poor and stranger: I am the Lord your God. Thou shalt not defraud thy neighbour, neither rob him: the wages of him that is hired shall not abide with thee all night until the morning. Thou shalt not curse the deaf, nor put a stumblingblock before the blind, but shalt fear thy God: I am the Lord. Ye shall do no unrighteousness in judgment: thou shalt not respect the person of the poor, nor honour the person of the mighty: but in righteousness shalt thou judge thy neighbour" (Lev. xix. 9, 10, 13, 15).

Here are direct and explicit instructions to the well-to-do with regard to their treatment of the poor and needy, the fatherless, and the widow. The former are not at all times to insist on their rights; generosity and consideration for all the afflicted are to be shown. Notice the *form* of the charity; it is really the provision of remunerative work. Nothing is given to "the poor and the stranger" who are unwilling to glean and to reap the corners of the fields. Notice also that these laws are emphasised with authority—"I am the Lord"—and that the blessing of God upon "the work of thine hands" is made contingent upon the care and consideration shown to the poor by the fulfilment of these requirements.

Finally, we turn to the teaching of Jesus. And His greatest teaching is surely His own example. To Him came the poor, the sick, the halt, the lame, the blind, the sinful, the lonely; and He healed them all. "He went about doing good." Indeed, His presence here at all is His greatest act of compassion. "He was rich, yet for our sakes He became poor." In the light of His own life must we read the following extracts from His sayings. We take first one of the most beautiful of all His parables. The story needs no explanation. The attitude of others to the poor wounded man is that to which Christ calls attention. He means to say that wherever on life's rough road we meet with the broken, afflicted, troubled ones, then our attitude must be one of self-forgetful love; we must spend and be spent in ministering to our brothers and sisters of sorrow.

"And, behold, a certain lawyer stood up, and tempted him, saying, Master, what shall I do to inherit eternal life? He said unto him, What is written in the law? how readest thou? And he answering said, Thou shalt love the Lord thy God with all thy heart, and with all thy soul, and with all thy strength, and with all thy mind; and thy neighbour as thyself. And he said unto him, Thou hast answered right: this do, and thou shalt live. But he, willing to justify himself, said unto Jesus, And who is my neighbour? And Jesus answering said, A certain man went down from Jerusalem to Jericho, and fell among thieves, which stripped him of his raiment, and wounded him, and departed, leaving him half dead. And by chance there came down a certain priest that way: and when he saw him, he passed by on the other side. And likewise a Levite, when he was at the place, came and looked on him, and passed by on the other side. But a certain Samaritan, as he journeyed, came where he was: and when he saw him, he had compassion on him, and went to him, and bound up his wounds, pouring in oil and wine, and set him on his own beast, and brought him to an inn, and took care of him. And on the morrow when he departed, he took out two pence, and gave them to the host, and said unto him, Take care of him; and whatsoever thou spendest more, when I come again, I will repay thee. Which now of these three, thinkest thou, was neighbour unto him that fell among the thieves? And he said, He that showed mercy on him. Then said Jesus unto him, Go, and do thou likewise" (Luke x. 25-37).

Next comes the great picture of "that great and notable day of the Lord," when "we shall all appear before the judgment seat of Christ." Our attitude to the needy and distressed will determine, to a great extent, our lot in the Day of Judgment and after. Any kindness done to the least of these will be counted as having been done to Him; any neglect of these will be construed as neglect of Him.

"When the Son of man shall come in his glory, and all the holy angels with him, then shall he sit upon the throne of his glory: and before him shall be gathered all nations: and he shall separate them one from another, as a shepherd divideth his sheep from the goats: and he shall set the sheep on his right hand, but the goats on the left. Then shall the King say unto them on his right hand, Come, ye blessed of my Father, inherit the kingdom prepared for you from the foundation of the world: for I was an hungred, and ye gave me meat: I was thirsty, and ye gave me drink: I was a stranger, and ye took me in: naked, and ye clothed me: I was sick, and ye visited me: I was in prison, and ye came unto me. Then shall the righteous answer him, saying, Lord, when saw we thee an hungred, and fed thee? or thirsty, and gave thee drink? When saw we thee a stranger, and took thee in? or naked, and clothed thee? Or when saw we thee sick, or in prison, and came unto thee? And the King shall answer and say unto them, Verily I say unto you, Inasmuch as ye have done it unto one of the least of these my brethren, ye have done it unto me. Then shall he say also unto them on the left hand, Depart from me, ye cursed, into everlasting fire, prepared for the devil and his angels: for I was an hungred, and ye gave me no meat: I was thirsty, and ye gave me no drink: I was a stranger, and ye took me not in: naked, and ye clothed me not: sick, and in prison, and ye visited me not. Then shall they also answer him, saying, Lord, when saw we thee an hungred, or athirst, or a stranger, or naked, or sick, or in prison, and did not minister unto thee? Then shall he answer them, saying, Verily I say unto you, Inasmuch as ye did it not to one of the least of these, ye did it not to me. And these shall go away into everlasting punishment: but the righteous into life eternal" (Matt. xxv. 31-46).

Finally, there is that gracious saying which assures us that even our poorest efforts to relieve the feeble or needy or sick shall in nowise go unrewarded.

"And whosoever shall give to drink unto one of these little ones a cup of cold water only in the name of a disciple, verily I say unto you, he shall in no wise lose his reward" (Matt. x. 42).

Such is the teaching of Jesus; the actions of Christians must correspond. No wonder is it that when the writers of the New Testament epistles thought of Jesus it seemed to them as though it was in this direction that one must look who would find the very essence of religion.

"Hereby perceive we the love of God, because he laid down his life for us: and we ought to lay down our lives for the brethren. But whoso hath this world's good, and seeth his brother have need, and shutteth up his bowels of compassion from him, how dwelleth the love of God in him? My little children, let us not love in word, neither in tongue; but in deed and in truth" (1 John iii. 16-18).

"Pure religion and undefiled before God and the Father is this, To visit the fatherless and widows in their affliction, and to keep himself unspotted from the world" (Jas. i. 27).

See Matthew Arnold's *Saint Brandan*.

Wood-carving in Switzerland.

BY JULIAN GRANDE, F.R.G.S.

IN many ways the Swiss, as a nation, continue to persist in an unintelligent conservatism so far as modes of life and habits are concerned. Even if they are shown that their old ways are not the best, it makes no difference. When, however, it is a question of improving or developing an industry which promises to bring grist to the mill, they, like other nations, are always ready to give up the most cherished old traditions. This is especially true in the case of educational establishments.

Ever since Switzerland became the playground of Europe, few tourists have left it without taking with them some specimen of the wood-carver's art.

Originally the wood-carving industry was in the hands of the peasantry, who spent their long winters in the cutting out of wood with plain clasp knives, little bears, chamois, and other trifles and knickknacks.

It was about the year 1817 that it occurred to a certain man called Fischer, who herded his flocks of goats near the Giessbach Falls, that he might turn an honest and much-needed penny by carving napkin-rings, pipes, salad spoons and forks, etc., and selling them as souvenirs to tourists. From these small beginnings the whole Swiss wood-carving industry has developed. It has long been a regular calling around the Lake of Brienz and in the Hasli Valley, near Meiringen. The principal tourist resorts, such as Lucerne, Meiringen, Interlaken, Grindelwald, and Thun—not to speak of larger towns such as Berne, Geneva, and Lausanne—have now all a number of shops crammed with wood-carved articles, from a tiny cork to a life-sized bear.

Yet the majority of Swiss tourists, who so much admire these shops and the articles sold therein, know absolutely nothing of the artists who spend their days producing them with chisel and hammer. These artists are seldom, if ever, in the places where the biggest wood-carving shops are to be found, or to which tourists flock. They live away from beaten tracks, secluded from the bustle and noise of "trippers." Their homes are pretty chalets, with vines, Virginia creeper, and fruit trees trained to grow over them, and their windows in summer are full of bright geraniums, carnations, and fuchsias. Such artists are very numerous in the neighbourhood of the Lake of Brienz and in the Hasli Valley.

JAKOB HUGGLER, "THE FATHER OF BRIENZ WOOD-CARVING," AT WORK IN HIS CHALET.

ONE OF JAKOB HUGGLER'S SONS, WHO HAS SPECIALISED IN EAGLE-CARVING.

One of the oldest artists in Brienz, who is now seventy-six years of age, and who has still not quite laid aside his chisel, is Jakob Huggler, known as "the father of Brienz wood-carving." As each artist has his own particular branch of work in which he excels, so old Huggler seems to have spent his life in carving figures and faces. Some of his statues and busts in wood are to be found in many of the best homes in Great Britain, her colonies, and the United States. One of his sons excels in the carving of eagles. Another excels in the

BUST OF THE FAMOUS GUIDE MELCHIOR ANDEREGG, CARVED IN WOOD BY HUGGLER, JUN., BRIENZ.
(In the possession of the author.)

carving of chamois and other animals; while the eldest son has followed his father, and become a skilled figure and face carver. The bust of Melchior Anderegg, the famous Meiringen guide, now eighty-six years of age, a photograph of which is reproduced, is the work of the eldest son of old Jakob Huggler. Those who know Melchior Anderegg will have no difficulty in recognising him, either from the bust or from the photograph of it. The former, I am pleased to say, is in my possession, Melchior Anderegg having been guide to my mother and myself when I was still only in my teens.

Eagle-carving is greatly encouraged, because of the constant demand of Americans for this class of work. Every year hundreds of Brienz eagles are exported to the States, and for some very high prices are paid. One Brienz eagle-carver told me: "We could sell hundreds more in America if it were not for the heavy duty charged on them. We have the same difficulty with Germany," he added, "except that Germany taxes wood-carving by weight. The English are our best customers, and they generally choose useful, solid articles, such as umbrella-stands, tables, picture-frames, and wardrobes."

Herr Ed. Binder, who has the largest wood-carving works at Brienz—or, for that matter, anywhere in the world—and who employs nearly three hundred persons, informed me that he even fits English churches with lecterns, pulpits, and altar rails. The carvings in the chancel of the English church at Thun, which have often been admired, were executed by Herr Binder, the cost being defrayed by Lady Boulton, in memory of a daughter who died in Switzerland.

Herr Binder, who is a thorough Swiss republican, is nevertheless proud of the fact that he had the honour of presenting a Swiss chalet, fitted up as a jewel-box, to Her Majesty Queen Mary when, as Princess of Wales, she visited Switzerland a few years ago.

It may not be generally known that our Queen, whose choice of the name Mary is very much disliked by the Swiss, spent some time in the Bernese Oberland, and made some ascents of many minor mountains. Her Majesty took much interest in the wood-carving industry, and the Swiss chalet is the principal jewel-box used by her.

Wood-carving in course of time became so important an industry that the Swiss Government, which has a very keen eye for all signs of industrial progress, opened technical and wood-carving schools for young people. Boys showing talent for drawing or modelling were encouraged to enter the schools. The most important of these schools is the Schnitzlerschule (wood-carving school) at Brienz. Here boys are received at the age of sixteen. They have already acquired some knowledge of drawing at the technical schools which abound everywhere in Switzerland. A boy is provided with his tools, which at first are few and simple, and also with the necessary wood. He is allotted a small desk for his work, with places for keeping his tools.

During the first year a boy must make up his mind whether he wishes to specialise in any particular kind of carving, and if so, in which. For example, he may elect to devote himself specially to carving the human face and figure, the most difficult class of work; or to carving animals; to eagle carving; to foliage work and ornamental carving; or to flower carving. Full freedom is given to a boy to follow his own particular inclination.

FAMILY OF DEER, CARVED IN WOOD.

(To be continued.)

Modern Psychology and the New Methods in Education.

BY W. H. WINCH, M.A. (CANTAB.),

Honorary Treasurer of the British Psychological Society; Member of the British Association Committee on Mental Measurements; Chairman of the Committee of the Teachers' Guild of Great Britain and Ireland on Psychological Research in Schools.

III.—Educational Psychology and Experimental Pedagogy.

LAST month I used two terms—educational psychology and experimental pedagogy — which, from conversation with teachers, I find to need some explanation. As every good teacher knows, to give definitions is not so much to impart knowledge as usefully to summarise it; and I hope the whole course of these articles will be the *best* answer to the questions, What is educational psychology? What is experimental pedagogy? Still, there may be some value in a preliminary outline.

In America the new science is generally called educational psychology; in Germany it is usually called experimental pedagogy; whilst I have used the two terms. Does this indicate that, in my judgment, there is such a real distinction between the two things that two names are desirable? This question I answer strongly in the affirmative. Educational psychology deals with the natural growth of the child's mind; the educational psychologist tries to find out the laws of natural growth; he wants to know, as far as he can, what goes on independently of the educative process. I say as far as he can, for no living being can escape from the educative processes of life, however far he may succeed in escaping from those of the teacher and the classroom. I ought, perhaps, to have said that the educational psychologist tries to find out the laws of natural growth apart from the effects of consciously directed education.

Let me illustrate the point by means of an example. We all agree that children should be helped to perceive and appreciate colours, both in art and in Nature. We believe that a person who is made alive to that aspect of the world he lives in is, *ceteris paribus*, better educated than a person whose colour sense has not been thus developed. And most teachers know the six coloured balls (white and black being omitted) of the Froebelian Gift I. How was it that these six colours—red, orange, yellow, green, blue, violet—were selected as those with which the teaching of colour should be commenced? Was it from the psychologist that the prescription was obtained? By no manner of means. They are (with one exclusion, indigo, which few of us can see) the colours of the rainbow. That is following Nature with a vengeance; but it is *not* following the nature of the child. He does not equally perceive all the colours of the rainbow; and it seems more common sense to say, "Let us begin our teaching with the colours which he perceives first and perceives most easily." Then we turn to the educational psychologist and ask, "What is the natural order of the development of the colour sense in the young child?" It is his business to supply the psychological data on which educational processes may be built. This is exceedingly difficult work. Only those who have attempted some research themselves, even though it be but a little piece, can know how difficult. But it is being done bit by bit, and once England is alive to economy in education, will be done more quickly and on a bigger scale.

But when it is done, and as far as it is now done, what then? Then, using the knowledge of psychology as a basis, methods of teaching will be constructed so as to use the energy of teachers and children in the best way. Here the reader will be disposed to say, "Where does experimental pedagogy come in? We seem now to have got all we want without it."

Well, there is a school of educators, sentimental and theoretical rather than practical, which is inclined to stop just there. It is against such people that the teacher complains that education based on psychology seems to him letting the children do what they like, and learn, or not learn, what they like.

But their view is not the view of educational science, which is rather on the side of the teachers. Mere psychology won't do; there must be methods of education as well as psychological observations. And the test of the methods will be, like the test of all things in science, what we can get out of them. And we must not merely *guess* what our methods will produce; we must apply experimental methods to see what is actually produced. All these processes are part of the science of experimental pedagogy, and are not simply educational psychology.

Let me now turn to the third element of my title.

IV.—The New Methods in Education.

Let us not think that every method which is labelled "new" is better than every other which may be older. There are some details of new methods which are by no means psychologically grounded, though they may claim to be. But setting aside all detail for the present, there are certain broad features of the new methods in education which are incontestably sound. Let us look back a little. Many of my readers will remember when the important consideration for the teacher was what the children could do on parade day, when all children were tested in an individual examination by an inspector. One of the weak points was that the inspector

did not always know how these results had been obtained. The strong point was that it was the children's work on which the school was judged. Then came a great change. Schools were judged by inspection. This meant listening to teachers while they taught. And if ever there was a time when schools were judged on the teachers' ways and not on the children's ways, on what the teacher could do and not on what the children could do, it was the period of inspection. I say, it *was* the period of inspection. Have we not inspection now? Yes, we have, but from a different point of view. For it soon became evident that good method, as method was then practised, seemed to leave very little for the child to do at all. He listened to an engrossingly interesting teacher, and answered a question now and then—the lesson was all chopped up in little bits, so that he could come in here and there. It was all extremely pleasant for the onlooker; even Matthew Arnold was deceived by similar operations in the schools of Germany, and thought the children were hard at work; but when one looked for permanent and consecutive results on the part of the pupils, the search was apt to reveal some glaring deficiencies. Our schools became talking-shops—for the teachers, I mean. They got sore throats as well as disappointments. Yet even to-day one can hardly go near an elementary school without hearing voices, not so much the old inattentive and simultaneous bawling of the children, but the monologues of the teachers.

The new methods in education say to this, "Wrong: let the child work; let the child think; don't tell him all the while; compel him to think (if you can); do not do all the work for him; it is his work we want, not yours; it is his attempts, it is his investigations, it is his ways of setting about work which will tell us whether the school is good or not. Do not invent elaborate, long-winded, and round-about ways for teaching the simplest things; let the child learn them right away." It is the child, the child, always the child and his activity that the new methods have in view, and in this respect modern psychology is wholly in agreement with the new methods in education.

V.—What Teachers can do to Help.

I have spoken of the new sciences—educational psychology and experimental pedagogy. They are not yet complete, *totus teres atque rotundus*. Especially in England are we lacking. Many of our newer educational prescriptions are German and American. They are none the worse for that, except that they are based on evidence derived from observations on children who are not English children, and therefore may not be quite applicable to our children—in some cases I am sure they are not.

We shall have to build up our own scientific pedagogy. We must go to the English child himself, and on the results of our own observations on him we must base our practical procedure. How can teachers help, and how can the *Practical Teacher* help teachers? Somewhat, I think, in this way. As from time to time you read of opinions and observations in these articles of mine, send to the Editor any observations of your own, or questions bearing on your psychological difficulties. We do not promise to be able to answer all your questions; nobody but a quack would claim to do that. We do not promise to give space to all your observations. But we do undertake to give careful consideration to all of them. You will often find your difficulties dealt with in subsequent articles, and I can be clearer and simpler if I know just what your difficulties are.

One word of personal explanation. If you write to the Editor and are not satisfied, it will always be his fault. If you get your observations noted and your questions answered, you may at once conclude it is my fault.

Why should not the *Practical Teacher* become a sort of "clearing-house" among teachers, to deal with and transfer knowledge on all elementary questions in educational psychology and experimental pedagogy?

(*To be continued.*)

Nature Study. By Horace H. Cummings, B.S. (*American Book Company.*)

A thoroughly practical book on "Nature Study," written by a former supervisor of Nature Study, State Normal School, University of Utah. Having perused this (the second) book, we should like to read Book I. The illustrations—mostly from photographs—are most helpful; so much so that we would like to see many more inserted in the next edition (for next edition there should be). Several of the lessons contain a suitable experiment; this is a splendid feature of the book. The writer not only knows his subject, but has the happy knack of writing in an interesting manner.

Nature Studies by Night and Day. By F. C. Snell. (*T. Fisher Unwin.* 5*s.*)

This volume, especially to lovers of Nature Study, will be a source of pleasure and knowledge. To the ordinary reader we can cordially recommend the book, as after its perusal he will probably, like Oliver Twist, ask for more. The text is splendidly illustrated by reproductions of photographs taken by the author, some of which, especially those of cloud photography, are real works of art. The chapter on "The Life-History of the Common Frog" is the one we were particularly struck with. The book is suitable for a prize for the scholars in secondary and private schools, and also for college students.

Farm and Field. By W. Francis Rankine. (*Pitman and Sons, Limited.* 1*s.*)

In the space of 104 pages the writer has touched on many operations on "Farm and Field" in an interesting manner. Some of the full-page illustrations are of a striking nature, and should prove useful for the "Oral Composition" lesson. We can cordially recommend this book as a small country reader for the senior scholars in our rural schools. The author possesses the artistic gift in no small degree, for some of the pictures that he has drawn are of considerable merit.

The Organisation of Juvenile Employment.

BY JOHN PERKINS.

(*Continued from page 158.*)

[*Mr. Perkins is making special inquiries into the matter of the relations between the school and the employer. Our schools are charged with sending out boys and girls unfitted for the practical work of life. We do not intend to get sore-headed over the charge, but to make an honest endeavour to find out what the employer wants and then to give it to him.*—EDITOR.]

A LETTER to parents issued from the Durnsford Road School, Wimbledon, recently came into my hands. It seems to me so admirable in inception and aim that I venture to quote very fully. After drawing attention to the difficulty of finding suitable vocations, the letter continues: "With your co-operation (and I cannot do it without) I propose to attempt to solve this difficulty by forming, in connection with the school, a bureau the aims of which will be fourfold in character:—

"1. To obtain information with regard to the trades and professions available to our children.

"2. To obtain early information with regard to posts vacant or likely to be vacant.

"3. To supply this information to parents desirous of making use of it.

"4. To confer with parents on the school's knowledge of the capabilities and characteristics of the children, and to attempt to find and obtain posts suitable for them."

The letter emphasised the desire to make the school an efficient part of our economic machinery, drew attention to a form enclosed upon which information might be supplied, and invited fathers to consult the headmaster at the schools—one evening a month being arranged for this purpose.

Anxious to ascertain what success had followed, I made inquiry; and the headmaster, Mr. Frank Challenor, writing to me, said: "The whole thing will plan out very nicely, given time and patience.....

"THE PARENTS APPRECIATE THE LETTER.

"They come to see me, at their own request or at mine, eagerly. I send one parent seeking information to another who has information. These two consult. This will be the most valuable part of my plan later."

The whole idea seems excellent, and promises to effect much in cultivating a real *esprit de corps* outside its primary object in systematising employment.

But if the head teacher is to give satisfactory and sound advice to an inquiring parent or scholar, the records of the school should be so arranged as to supply the necessary data ready to hand. For this purpose a periodical record should be made of a scholar's progress. What is needed is a *dossier* for each child, which should contain a tabulated record of his progress in each main branch of instruction, attached to the test papers worked from time to time as he passes through the school. Experience tells me that such a *dossier* can be kept with very little trouble; and its value, combined with the medical inspection schedule, when advising as to future career, is self-evident.

Then, when leaving the ordinary day school, each scholar should be entitled to something in the way of a discharge paper—a school leaving certificate—setting out such points concerning his attainments and character as might be of service in selecting a suitable calling. Then if we have—as we must have—some form of practical continuation classes, this elementary discharge paper might be exchanged at the end of the adolescent period for another with more up-to-date particulars.

I know it will be objected that this means more clerical work; but I am convinced that it is well worth while, and certainly of far more value, than some of the useless notes of lessons and work of that nature for which it might well be substituted.

But having given the lad his discharge paper and fixed him up with employment—skilled or unskilled, as the case may be—what then? Are we in the schools to wash our hands of him? That has been the method of the past, and that, in my view, is the cause of much of the unsatisfactoriness of the present-day youth. We keep him on crutches till he goes to work, and then deny him even the support of a staff! No! By hook or by crook we must keep a hold on the boy and the girl until they reach the age of discretion. As Mr. Russell said, the conditions need changing, and there seems to be no adequate way of accomplishing this except by means of old scholars' associations. Here and there we find promising institutions of this kind in connection with elementary schools.

One Thursday evening in July I spent a most illuminating couple of hours at the Old Boys' Club, conducted in connection with the Northey Street L.C.C. School, Limehouse. As a preliminary I explored the district. There was no help from the environment here. Talk of the beauties of Nature and the uplifting value of all the humanities! What part can they play amid such surroundings? Not a tree, not a piece of greensward, not a flower was to be seen. Even the blue vault of heaven was hidden in these narrow streets, skirted with back-to-back tenements,

ALIVE WITH BAREFOOTED CHILDREN.

Chance took me to the riverside—to the pier. Banish all visions of that pier, with its life and gaiety, so well beloved of some holiday makers! 'Twas simply a landing-stage; but here was an assortment of little ones in charge of others not so little, come down to the water's edge to get a breath of God's own fresh air, to watch the passage of the craft up and down the river, and to listen to the music of the ripple and the wash. There was the kindly policeman, fearsome lest some unlucky babe toppled into the muddy stream. "Limehouse Park?" said I. "No," he replied; "the churchyard is called The Park."

Then I hied me to the Old Boys' Club, which I had heard was one of the most successful in the country. Truly what I had seen led me to be sceptical. But once inside the Northey Street School all idea of illusion was dispelled, for there I found some fifty or sixty well-set-up, clear-eyed lads taking their pleasures—billiards and bagatelle, boxing and gymnastics, chess and draughts—with keen enjoyment; self-disciplined, self-ordered, evidently attached to the institution of which they are members.

The club has been in existence for some twenty-five years, Mr. Cyril Jackson, Chairman of the L.E.C., one of the present managers, being the prime founder. The keenest interest is taken in the club by all the managers, and I was fortunate enough to have chosen a night when all of them were present. There was no stand-offishness. The manager was hail-fellow-well-met with the youngest member; and from conversations I overheard it was evident that the life of the lads was influenced by these associations.

The club has both an educational and a social side. Only old Northeyites are admitted, and they are expected to attend the classes regularly if they desire to participate in the pleasures. Among the subjects taught are shoe-mending, physical exercises, ambulance work, and shorthand; and at the beginning of the session the lads choose the course they wish to take up.

I had an interesting chat with Mr. W. J. Williams, the responsible teacher, who for over twenty years has been the mainstay. There was no mistaking the excellent relationship existing between him and his lads. About twenty boys leave the day school yearly to go to work, and, with few exceptions, they immediately attach themselves to the club.

There is no systematised employment agency, but a Northeyite is known in the district, and is sought after; and although many of the lads go into what are called unskilled employments, the attendance at the continuation classes tends to make them more fit and more enterprising, and they are seldom out of employment. The managers and Mr. Williams, being in such intimate touch with the boys, know immediately when one is out of employment, and no difficulty is experienced in getting him work again, the fellow-members doing their part to help a comrade into a job.

Mr. Williams was not at all overcome by the seeming hopelessness of the environment. Boys to him are the same all the world over, for *alma mater* makes just as much appeal to boys of the Limehouse type as to those of Eton and Harrow. That seemed to me to be an important factor in the success of the club. The sense of solidarity, of *esprit de corps*, had been played upon for all that it was worth, with the consequence that

THE LADS TOOK AN EVIDENT PRIDE IN THEIR ASSOCIATION WITH THE SCHOOL.

I quote from the circular issued by the managers at the commencement of last session, giving particulars of the classes and athletic institutions:—

"DEAR OLD NORTHEYITES,—Here we are again! Not quite the same lot—some are gone away, and all are older; but we have young friends who are going to join our club, and we want you all to sign on and support the old firm!

"But you must remember that, though we speak to you as managers, it is *your* club, and what you make it—what each boy makes it, by putting all his will and mind into training himself to be of some use to himself and others. 'Each for all, and all for each' is our motto, and the motto of friendship. Don't forget it!

"Come in under the flag and take your place in the classes and club, and let us have *some good work and play* in the club this year. This can only be done if you who read this *make up your mind and stick to it*. So good luck to you."

Not the language of literature, is it? None the less it is the familiar style which makes an appeal to fellows all the world over, and the circular is typical of the attitude of the managerial body to the lads. The club is successful in its attachment to football and swimming, and every year a large number of members spend a week together in camp. On the evening of my visit arrangements were being completed for a week's camp at Tilford (Surrey), where forty lads were to spend the last week in July.

But, as Mr. Williams insisted, it is not *all* fun. The continuation classes are an essential feature of the club. The lads like to feel that they are improving themselves. The managers take a share in the instruction, and are especially useful when a dramatic entertainment is being arranged, Shakespeare being none too ambitious for these keen folk. Mr. Cyril Jackson recalled the time in the early years when he took lessons in metalwork in order to teach it to the Northeyites. There is another secret of the place! The managers and all the workers are imbued with the secret of service.

Some such agency as this is needed in every school in England; and until such are initiated, Juvenile Employment Bureaus will often exist in vain.

THERE ARE TWO ESSENTIALS TO SUCCESS—THE MAN AND THE MONEY;

but of these Mr. Jackson considered the man the more necessary. At Northey Street, in Mr. Williams, he thought they had the right man; and from all I could see, I could but echo the parrot cry: "There is no doubt about it." So we find that here, as in all other forces, educational personality is the chiefest factor. You may pass Acts of Parliament, issue departmental edicts, perfect your organisation, and set up costly machinery without end; but unless you can get the man—the right man—to carry the thing into practice, your scheme is doomed to failure at the outset.

I have dealt at some length with this successful Old Boys' Club, because it seems to me to be a pattern which we may well copy. Loyalty, patriotism, and partisanship lie dormant in most youngsters; and these instincts should be stirred to the depths, and exploited to the utmost, in order to hold them together in the difficult days of their youth, when they are unbalanced mentally, morally, and physically.

It will take time to set up the necessary machinery in connection with the Labour Exchanges, but that does not absolve us from getting to work now with our part of the business. Let us immediately make methodical records of each child's progress, let us follow up the career of those who have left us during the last few years, and let us set up some association to which they may attach themselves on leaving school; and then, when advice and information are demanded from us, we shall be able to supply them with accuracy and confidence. But above all, while we shall never cease to care for the bright, intelligent, and satisfactory scholars, do not let us lose sight of the backward, unintelligent, and troublesome children. So often are we relieved when they pass from the school walls, as we hope, for ever, little thinking that from their ranks will come the casuals and unemployables of the future, whose career will reflect no credit upon us, and give us no satisfaction when we review our life's work. The less native endowment of mind and soul a child possesses, the more should our common humanity lead us to endeavour to supply the deficiency.

FAR AND NEAR.

INTERESTING ITEMS DRAWN FROM VARIOUS SOURCES.

The Hay-Rake.

I CULL the following from the current issue of *The Country Home*, a particularly good number of a monthly which exists without fiction, and is therefore noteworthy. The paragraph describes an industry undisturbed by the march of "progress."

> "In Surrey is the well-known village of Newdigate. The pedestrian strolling along the country road in the vicinity of this village finds, among the fine old oak trees, two small cottages and outbuildings inhabited by a family of hay-rake and trug makers, and will be struck by the quantity of cut timber surrounding these buildings. On going behind the shed two men and a lad will be found, one of the former making the back of the rake, with a wooden clamp-horse between his legs in order to hold the back whilst being 'shived' down with a blade with a handle at either end. The boy will be forming the teeth with a funnel-shaped instrument on a block of wood; a peg-shaped piece of wood is placed on top of the funnel and driven down by a mallet, filling up the funnel; the next piece is placed on top, driven down, and at the same time pushing the first piece clear of the funnel into a bucket underneath. On entering the shed there is seen a turning machine, worked by a 'horse-gear;' the rake handles are placed into a revolving slot which turns it, while an instrument called a 'reuter' is run up and down to smooth the handle. After being in the shed a few minutes there is heard 'Woo, boy,' and on looking out of the cobwebbed rustic window one sees an old lady driving a horse round and round while she is knitting her stockings. 'Gee up,' and off they go, and another handle is made smooth, then a stop, and so on. When coming out of the shed a long copper is observed, which is used for boiling the handles, so as to enable the workers to bend them to the required shape; a number are put into the copper and boiled, then taken out and bent on a wooden horse to the required shape, and stacked to dry. The fire is stoked with the odd pieces of wood and shavings."

Fairies and Lapps.

We must "account for" everything in these days, but the following attempt of Mr. J. G. Campbell in the *Scottish Historical Review* is the most ingenious piece of reasoning I have seen for some time:—

> "There is evidence that the climate of Europe was much more rigorous in primeval days than it is now, and the aboriginal inhabitants, ignorant of iron, must have lived in much the same way as those now live who reside near to, and within, the Arctic circle. On the supposition that the fairies were these aborigines, an easy explanation of a great part of the superstition is furnished.
>
> "It is noticeable that the fairies dwelling together and shifting their quarters in companies and societies, the 'wandering, roaming' fairy women, the 'little men,' the underground dwellings, the association with deer (which were the fairy cattle), the dogs, the magic knowledge, and the enchanting glitter of fairy dwellings, all find their counterpart in the migratory habits of the diminutive Lapp, his round hat, his reindeer and dogs, his practice of witch-craft and divination, and the glitter of ice."

After this some one ought to explain away the Campbell clan.

How to teach Geography.

Mr. C. H. Gore, in the *Parents' Review*, describes a method of teaching this difficult subject which will commend itself to all our readers.

> "Suppose now you are going to give a lesson on Yorkshire. First, draw a map of a totally imaginary country with a strange sea-coast, some rivers, and contour lines to show the levels of the mountains and plains, with shaded patches to show the position of coal and iron fields. The boys would copy this roughly, and would then be asked to mark towns in likely positions and railways connecting them. At once they begin to think. Coal mines mean towns, the estuary of a big river means a harbour and a town. A nice-looking bay with hills at the back means a watering-place, and so on. And then comes the indescribable joy of planning railways to connect the towns. Not too many tunnels on account of expense, nor yet too many bridges. Then you go to your own map and put in the towns and railways as seems best to you, and a lively debate follows naturally. One boy has put a railway across the slope of a precipice, another has ignored the coal fields, another the flat agricultural land, and so on.
>
> "After this, Yorkshire has meaning at every square inch of its map. Every town—Leeds, Sheffield, Hull, Bridlington, Beverley—classifies itself. The railroad paths are obvious. The great river system and the watersheds stand out clear. A little geology to account for the coal and a little more to account for the chalk and the clear flowing streams which make the Hull; a little history to account for York and the abbeys, and you will have presented a living ideal of how the geography of a district should be studied."

A Monastery—not in Ruins.

A writer in the *British Weekly* has been visiting Fulda, in Hesse-Nassau, where there is a living monastery which dates from the eighth century. He directs particular attention to the manual work of the brothers.

> "Perhaps the strangest experience was to see the lay monks, all in their monastic garb, engaged in various mundane occupations. To behold a monk, in gown and sandals, mixing mortar and carrying it to another monk, who was plastering a ceiling; to see a third, in like apparel, sawing or planing wood; others at work in the smithy; another washing clothes, or digging in the garden, or baking bread, or printing and binding books, was a strange sight, and one that will help to put life into many a ruined monastery that one sees in England."

We are apt to forget in the process of visiting and being bored by our own beautiful abbeys that the monastic institution sheltered practically all the peaceful professions and skilled trades of the earlier portion of the Middle Ages. It is this fact rather than the religious work of the monks which makes our abbeys interesting to the student of history.

Never too Late.

The contributor of the column entitled "The Point of View" in *Scribner's Magazine* is always refreshing and stimulating. Here is a bit for those who have to begin life again when past the time which is supposed to be consecrated to beginnings—as if we were not always beginning, even at the end!

> "Young Lady Burton asked a friend to teach her to fence, declaring that she wished to defend her husband when they were in the wilderness together. She set herself to learn everything which might fit her for a roving life, so that in desert or woods, with or without servants, she might be qualified for any emergency. She went to a farmhouse where she learned all domestic details—how to groom horses, milk cows, and tend poultry. One of the best dairy women in our Middle West, whose butter has taken many prizes, never milked a cow or saw a churn till circumstances made it necessary to take charge of an important dairy. She was over thirty at the time, yet she picked up the whole business almost instantaneously, because in the new work she regained that great motive power of the will, interest."

Change About.

And here is another extract which suggests ideas worth following out:—

> "The crossing of the radical line between man's and woman's work affords unexpected diversion. I knew of a young woman who studied in a Western school of mines at the same time that her brother was taking a course of

designing with a Parisian dressmaker. Benjamin Franklin travelled by coach from Philadelphia to New York. The journey took four days, and he knitted stockings to while away the time. Choiseul employed some of his leisure in exile by doing tapestry work in the drawing-room at Chanteloup, recounting delightful tales meanwhile of his long ministry to his distinguished guests. Jean Jacques sat outside his doorway making bobbin lace, and even carried his pillow about with him in the fields."

Let us try this diversion in the coming winter. Father shall come home and make a *blanc-mange*. Mother will knock in all the nails—unless she does this already, in which case father shall learn how to do it. Edwin shall do fancy work and practise patience, while Angelina shall talk about the land taxes.

Make your own Motor.

Here is a paragraph from the September *St. Nicholas* which will please Mr. Runciman. We commend the complete article to all our readers who are striving to keep thoroughly up-to-date.

"The motor is the most interesting, as it is the most important, detail of the aeroplane. Although it is possible to buy the propellers for the motor, it is advisable that every boy should work out this problem for himself. An effective motor is easy to build, and costs practically nothing. The length of your propeller-blades should be equal to about one-third the spread of your largest plane. For this you will need six strips of some light wood, such as pine or ash, although a cigar-box wood, if the grain be straight, will answer. Cut the strips to measure about half an inch in width and one-eighth of an inch thick.

"The strips should be covered with a thin glue and laid one on top of another, and a very thin nail carefully driven through the little pile at the exact centre between the two ends. While the glue is still soft, turn the sticks on the axis formed by the nail, so that they make a double fan, spacing the outer edges about one-quarter of an inch apart. Be certain that the fan is regular, and then give the nail a final rap to tighten its hold, and keep all the glued surfaces together, and set away to dry. If you can prop up the ends it will be better to put a flat-iron or other weight on each end to make the strips glue together tighter."

A Valuable Hint.

"The report that Stevenson's *Treasure Island* has been included in a series of American school readers," we read in *The Lady*, "has moved Mr. Andrew Lang and others to discuss the possibility of a boy ever liking any book which is included in the curriculum. Mr. Lang doubts whether any book entertains schoolboys in school. Will boys detest *Treasure Island* when it becomes part of their tasks? It seems more than probable. Byron, who loved Horace in later years, hated him at school. Many people have been unable ever to appreciate the beauties of Gray's *Elegy*, or of some famous speeches in Shakespeare—such as Mark Antony's oration, Hamlet's 'To be, or not to be,' and the mercy speech in *The Merchant of Venice*—because they had to learn them as a school task. Mr. Lang's contention that even the *Badminton Cricket Book* would be made unpalatable if it were included in the 'English class' suggests to a writer in *The Globe* the excellent scheme of working from books that no one can or need ever like in early years. But the drawing up of such a list would cause much quarrelling among a committee of experts."

This appears to me to be an argument for the much despised "extract," as well as a guide to editors in their choice of "purple patches." The selected passage taken from such a book as Boswell's *Life of Samuel Johnson* is not on the same footing as a passage from *Treasure Island*. The pupil will never read the former book in its entirety, but he will be all the better for reading well-selected extracts from the volume. He will cheerfully read the *whole* of *Treasure Island* at home, and does not need tempting with an extract.

The Training of a Princess.

We are all in love with our English princess who rules the royal home, and therefore rules the kingdom. And we love her all the better when we know that she is no spoilt darling, but promises to become a helpful, useful woman. We read in the *British Weekly*:—

"Two lady typists are attached to the secretarial staff at Marlborough House, one of whom, at the Princess Mary's urgent request, instructed her in the art of typing. The princess has proved an apt pupil, and devoted herself so assiduously to her work that, after a few weeks' instruction and practice, she was able to work a typewriter at quite a fair rate of speed. During her holidays at Balmoral she will assist in the typing of some of the more private correspondence of King George. The princess also intends to learn shorthand, and is said to be keenly looking forward to helping Queen Mary regularly with her correspondence when the royal family settle at Buckingham Palace."

Miss Nightingale in Literature.

Most of my readers can, of course, "place" this extract. We do not remember any reference to it in all the flood of Florence Nightingale reminiscences:—

"Three people were round his bed—a doctor in undress, a grey-haired gentleman, who peered into his face, and a lady.

"'God bless me!' said the doctor. 'We have fetched him through. Look at his eyes, just look at his eyes. As sane an eye as yours or mine, and the pulse as round as a button.'

"'Do you know us, my man?' said the gentleman.

"It was possible enough that he did not, for he had never set eyes on him before. The gentleman meant only, 'Are you sane enough to know your fellow-creatures when you see one?' Charles thought he must be some one he had met in society in old times and ought to recognise. He framed a polite reply, to the effect that he hoped he had been well since he met him last, and that, if he found himself in the West, he would not pass Ravenshoe without coming to see him.

"The doctor laughed. 'A little abroad still, I daresay. I have pulled you through. You have had a narrow escape.'

"Charles was recovered enough to take his hand and thank him fervently, and whispered, 'Would you tell me one thing, sir? How did Lady Hainault come here?'

"'Lady Hainault, my man?'

"'Yes; she was standing at the foot of the bed.'

"'That is not Lady Hainault, my man; that is Miss Nightingale. Do you ever say your prayers?'

"'No.'

"'Say them to-night before you go to sleep, and remember her name in them. Possibly they may get to heaven the quicker for it. Good-night.'

"In time he left watching the great arch overhead, and the creeping shadows, and the patch of light on the wall, which shaped itself into a faint rhomboid at noon, and crept on it till it defined itself into a perfect square at sundown, and then grew golden and died out. He began to notice other things. But till the last there was one effect of light and shadow which he always lay awake to see—a faint flickering on the walls and roof, which came slowly nearer till a light was in his eyes. We all know what that was. It has been described twenty times. I can believe that story of the dying man kissing the shadow upon the wall. When Miss Nightingale and her lamp are forgotten it will be time to consider whether one would prefer to turn Turk or Mormon."

How full-blooded Henry Kingsley's *Ravenshoe* is compared with most of our modern fiction!

Our Art and Handwork Section.

HONOURS PAGE.

"HONOURS" are this month gained by :—

1. Edward Marcroft (13), Hathershaw Council School.
2. Thomas Wharton (14), Valley Road Council School, Sunderland.
3. Florence Burton (16), Secondary School, Stourbridge.
4. Mary E. Edwards (11), Welsh High School, Ashford, Middlesex.
5. Edgar Boulton (13), Charnwood Street Council School, Leicester.
6. William Dawson (13), Hathershaw Council School.

(For "Commended" awards see next page.)

"Commended" awards are given to:—

S. Coleman (12), Cromwell Road Council School, Weymouth; W. E. Lawford (13), Fairfield's Council School, Basingstoke; Robert Warburton (12), Gray Street Council School, Bootle; Robert M'Kechnie (14), Gray Street Council School, Bootle; J. Salmon (12), Gray Street Council School, Bootle; Charles Mitchell (14), Gray Street Council School, Bootle; Amy Browne (13), Lily Lane Council School, Moston, Manchester; John C. Field (14), Church of England Boys' School, Frome; Albert F. Stickler (13), Church of England Boys' School, Frome; Richard Leach (10), Southfield Road Junior School, Acton; Barnard Gregory (10), Southfield Road Junior School, Acton; Joseph Guy (12), Beith Academy, Ayrshire; Walter Holmes (13), Allanson Street Council School, St. Helens; Joseph Roberts (13), North Walsall Higher Elementary School; Norman Nicholson (13), Belle Vue Road School, Leeds; John Barrow (11), New Herrington Boys' School, Fence Houses, Durham.

EDITORIAL NOTES.

Handwork in Education.

THE importance of handicraft as a part of general education is receiving great attention at the present time. Not far short of a thousand teachers attended the recent summer courses in England and Wales.

The issue of the Memorandum by the Board of Education, to which we referred last month, should make the issue clear to all educational authorities; while even the exclusive British Association has this year given considerable time to the discussion of handwork in its relation to education. The advisability and even necessity of including handwork in the curricula of schools is almost universally admitted, but there is not yet such unanimity as to just what the work shall be, nor is there apparently any burning desire on the part of the Treasury or education authorities to provide the money which such training must inevitably cost. These two points still await real practical solutions.

Drawing in Schools.

In this issue we commence the third series of articles in connection with drawing in schools. The first showed the work done in a good class Scotch school having infant, primary, and secondary departments, and the excellence of Mr. Ryle Smith's work at Grove Academy, Broughty Ferry, will still be fresh in our readers' memory. The second series illustrated the work done in the schools of Denver, under the supervision of Mr. Charles M. Carter.

We now propose to show what is being done in a small country school of less than a hundred scholars. The explanation of ways and means, aims and ideas, and the illustration by means of actual reproduction of children's work, should be of great assistance to teachers in the many schools similarly situated. The good work done in Tillmouth Council School was discovered solely by the excellent examples sent in for competition to the Honours Page. Many of these have been given in former issues.

THE TEACHING OF DRAWING.

BY J. P. RUDD.

IT is sometimes well to pause to look back on the different aims we have had since the time when Dyce's drawing book was the standard of everything that was good and proper in art drawing, and also to look forward to what goal we are aiming, now that every child in the infants' school can draw direct from Nature. We have tried so many methods that one is reminded of this paragraph in Oliver Onions's clever book, *Little Devil Doubt*:—

"When I first met Hughie Sadler he was experimenting with what he called the Monet method of painting—the method that was to make art easy. Thence he passed to the striping manner with a rigger brush. After that, discarding brushes entirely, he went in for sponges. Then he tried a sort of vaporiser called an air-brush, and, under the impression that the secret lay in the material and not in the man, bought a box of pastels. Hearken now to Hughie's sad end. I entered his studio a little while ago and found him plunged in the deepest dejection. About him were spread his canvases—canvases in the Monet manner, the striping method, air-brush, pastels, sponges, and all the rest of the izzums. And he was regarding them gloomily. 'What's the matter, Hughie?' said I. He has bright eyes, like a robin; he lifted them to me. 'Mildmay,' he said, 'I've come to the conclusion that I shall never be a great man.' 'Come, Hughie!' I said. 'No, no,' says Hughie, shaking his head. 'Why, whatever makes you think that?' I asked him. '*This head of mine isn't the right shape*,' said Hughie, and relapsed into gloom again. I left him to his grief."

And of this from the same book:—

"You have probably heard it said that if a stick be held up before the leader of a flock of sheep so that the animal jumps over it, the stick may then be withdrawn, notwithstanding which the rest of the flock will continue to jump over the place where the stick has been."

Now, what is our aim with regard to these youngsters? They certainly cannot all be great men, even though they may have the ambition of Hughie Sadler. This has been said by a great man: "The born builder's eye is like an ear for music, a facility for languages, or the power of drawing from Nature. All the application in the world will not do in years what any one of these does instantly, spontaneously, instinctively, without the smallest effort. You cannot make talent out of taste and industry. You cannot train a cart-horse to trot a mile in a little over a minute."—F. Marion Crawford.

It is certain that not more than two per cent. of the scholars in our primary schools will need to be draughtsmen to earn their living. Where, then, is our aim? What is the target? For without a target we are shooting aimlessly and hitting nothing. If writing is

"to speak beyond hearing where none stands by to explain," much more is drawing. It is the language of form. We express ourselves in form instead of a written word. This language is universal. If I do not know a syllable of a foreign language but have a facility of sketching, I can make fifty different foreigners understand my wants.

Let us see to it that we lay the foundation of this universal language firmly and on right lines. As we teach the letters of a language, the first two letters in art teaching are straight lines and curves. For as all music is founded on eight notes, so all drawing is founded on these two simple elements. These elements are found in plentiful variety in Dyce's drawing book (before mentioned), but in such a bald, uninteresting graduation that it was hardly enticing or interesting enough for youngsters of tender age to stick rigidly to Dyce and nothing else. Nevertheless, these lessons should never be left out of art education, any more than you would leave out the practice of scales in the curriculum of a pianoforte student. Other recreative work is necessary, and work from "masters" must be copied before any *creative* original work *can* be expected.

But don't let us play about like Hughie Sadler with every fad which comes along. We have done enough of this during the last twenty years. We have tried kindergarten squares, then freearm, next blob work, free-brush, copies only, charts only, no copies, direct Nature drawing, models, and goodness knows how many other methods have been tried in turn, to the exclusion for the time being of previous methods, which were dubbed old-fashioned and condemned to the waste-paper basket or the stove.

[Our correspondent doubtless means to imply that whatever method or system may be adopted, a sure foundation must be laid by a thorough grounding in the essentials. No one desires to go back to the deadly dull system shown in Dyce's drawing book (probably if he were alive he would himself be the first to break away from it); but our newer, more interesting, and enlightened methods undoubtedly demand far more careful teaching and hard work than they often receive at the present time.—EDITOR, ART SECTION.]

DRAWING IN PUBLIC ELEMENTARY SCHOOLS.

TILLMOUTH COUNCIL SCHOOL, CORNHILL-ON-TWEED.—I.

BY DAVID SUMMERSON.

INFANTS AND STANDARD I.

THE following is an account of the work done and the methods adopted in teaching drawing in a mixed country school in Northumberland. The school is situated in a delightful district. Twizel Bridge, across "the sullen Till," is quite near, and the Tweed is but a mile distant. There is never the least difficulty in procuring specimens for the Nature or drawing lessons; "fur, fin, and feather" are plentiful, and the woods provide us with more kinds of plants and flowers than we can use.

There are eighty children on the books, under a master and two uncertificated mistresses. The head teacher supervises the whole of the drawing, the assistants having charge of the subject in the lowest division. This ensures sound methods from the beginning, resulting in the children having nothing to unlearn at any stage.

Our children receive very little *instruction* in drawing during their first year at school, but I think they get quite as much as they need. To make up for the lack of teaching, they have a great amount of practice, and by the end of the year, have become so

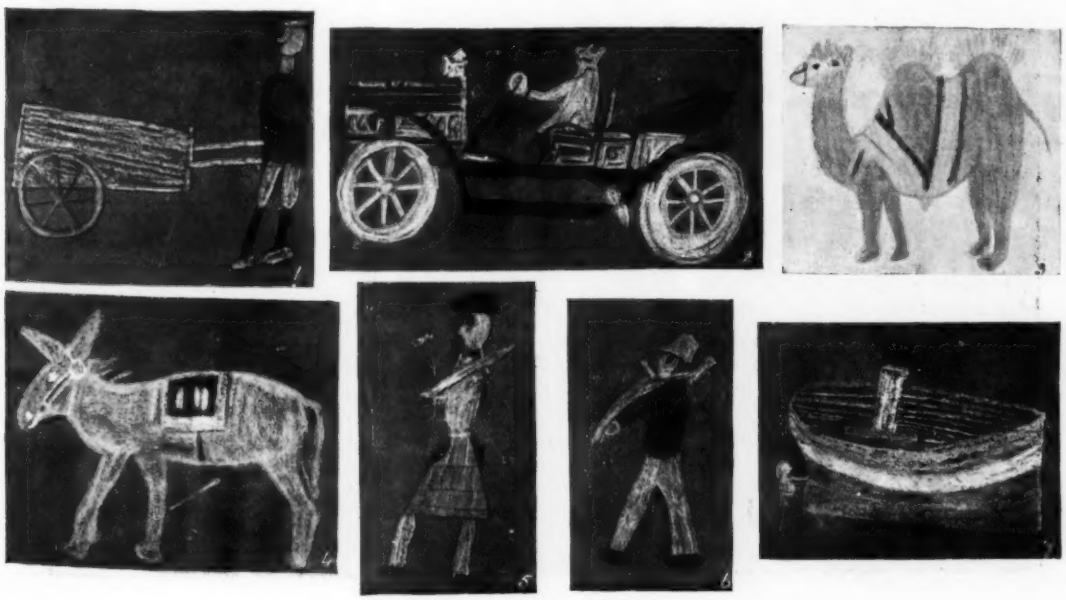


PLATE I.

PLATE II.

accustomed to handling chalk and crayon that a good foundation is laid for future progress.

We follow the plan of grouping usual in small country schools, the lowest division being made up of two classes of infants—upper and lower, and Standard I. For convenience of working, upper infants and Standard I. are taught drawing together.

The lower infants take drawing at the same time, but are given a very free hand. The important point with them is to see they have more than a nodding acquaintance with crayon and paper. To ensure this, they are allowed to draw anything they wish, they are not restricted to the use of any particular colour, and their drawings may be either large or small. They are encouraged to draw the forms they have built with sticks, or little things suggested by their fairy tales; but the only concern of the teacher for the first few months is that they should be fully occupied. As a rule the children are sufficiently interested in what they are doing to relieve any anxiety one may feel on this point.

The material used consists of odds and ends of clean brown packing-paper with a good rough surface, and the brightest coloured crayons we have. Sharpened sticks of blackboard chalk are good for little fingers.

The lower infants are at an imitative age, and as soon as they get used to handling the chalk we find them attempting the copies set for the upper division. Some of them about the same time begin to discriminate in their choice of colour—they will not, for instance, draw a yellow handle with red crayon, or a green leaf with purple. We can help them a little now, but no attempt is made to produce finished work, of course. They run absolutely free.

At the end of the first year we can safely try to give them some idea of proportion, chiefly through handling the actual objects to be drawn. It is essential that the articles chosen should be really familiar. The children should know how to use them, how they are built up, and what the different parts are meant to do. Skilful questioning by the teacher, and letting the little ones handle and talk freely, are the first steps towards good observation. What they see well they will in time draw well.

Systematic teaching begins in the second year. Common objects and simple leaves and fruit, from Nature, form the basis of the work. Careful observation is secured by devoting three out of every four lessons to object drawing. For purposes of demonstration, too, hand-made objects possess another advantage over natural forms, which vary so much in detail.

The objects are carefully thought out before being included in the syllabus; they must be interesting, simply constructed, and generally coloured. The greater the variety the better. We arrange the teaching so that difficulties are introduced gradually.

The following does not exhaust the list of suitable objects, but is fairly representative of the kind of thing at this stage:—

1. *Round.*—Hoop, ball of wool, cricket ball, orange.
2. *Rectangular.*—Slate, luggage label, purse, spectacle-case.
3. *Elliptical.*—Table-mat, egg, melon, palette.
4. *Straight and Curved.*—A combination of 2 and 1 or 3—racquet, battledore, float, cup and ball.

Tinted papers and brown-paper drawing-books are used, and each child has his own box of crayons. The objects are represented in mass. Five minutes or so at the beginning of the lesson are taken up with a little talk on the object, analysis of the form, etc.

Before actual drawing, the children trace the shape in the air with their fingers several times—a very good plan with young children. The shape they trace is the same they must draw on their papers. A hoop is a good thing to begin with. The children sit well back in the desks, with the papers just a little to the right, the crayon held ready for drawing, but clear of the paper. Let them now do the same "tracing" over and over again, moving the whole hand. The movement must be steady and deliberate, and is best shown by the teacher on sheets of paper pinned to the blackboard. The same time should be taken for the "tracing" as for the actual drawing. The tendency is to trace too quickly and draw too slowly, but practice regulates this.

When the children have had sufficient time allowed, the hoop may be put in with one sweep of the hand. Some of the worst faults are reproduced on the blackboard for criticism by the children.

The line must be continuous, however bad the shape may be. Any mechanical method of fixing the position of the circle by straight lines or drawing through dots is best avoided. Direct work is the aim from the beginning, as it minimises patching and rubbing-out later on. Guide lines and construction lines are simply a hindrance.

The rest of the lesson is taken up with further practice, the teacher seeing that the preliminary movement is made every time the children draw the hoop. The last drawing should be "a nice big one" on a clean sheet, and may be thickened to the required width.

Two or three other round objects are taken in succeeding lessons after the same manner, using the correct colour of crayon. The children are given slips of paper, so that they may try to get the exact colour for themselves. Spherical objects like the cricket ball are massed in by following the contour, and in this case the shape may be improved when filling in, care being taken, however, that the child points out the fault and corrects it himself.

After two or three weeks, rectangular objects are introduced. The difficulties new to the class are straight lines and two dimensions. The first difficulty is attacked by beginning with a straight-handled walking-stick resting horizontally on pins across the blackboard.

The children see the direction the stick runs by tracing the shape in the air as in previous lessons. After a few tracings over the paper, it is drawn without breaking off, the line stretching almost to the edge of the paper on each side. The handle completes the drawing. Enlarged drawings on the blackboard, helped by questions, make the proportions clear, and enable the children to say whether the handle is too long or too short.

The rest of the sheet is filled while the teacher is examining each child's work and giving hints where needed. The vertical line is taught another day, after the same method. At the end of the lesson we have a fair copy drawn on a clean sheet.

Flat rectangular objects are best approached through articles having proportions readily seen by the class, such as square envelopes, flags, photo-frames. Then follow those with sides twice as long as the ends—dominoes, labels, books. When the dimensions can be fairly accurately estimated, it is time for slight variations to be shown. Much oral work is required, and a great number of examples for comparison and contrast for

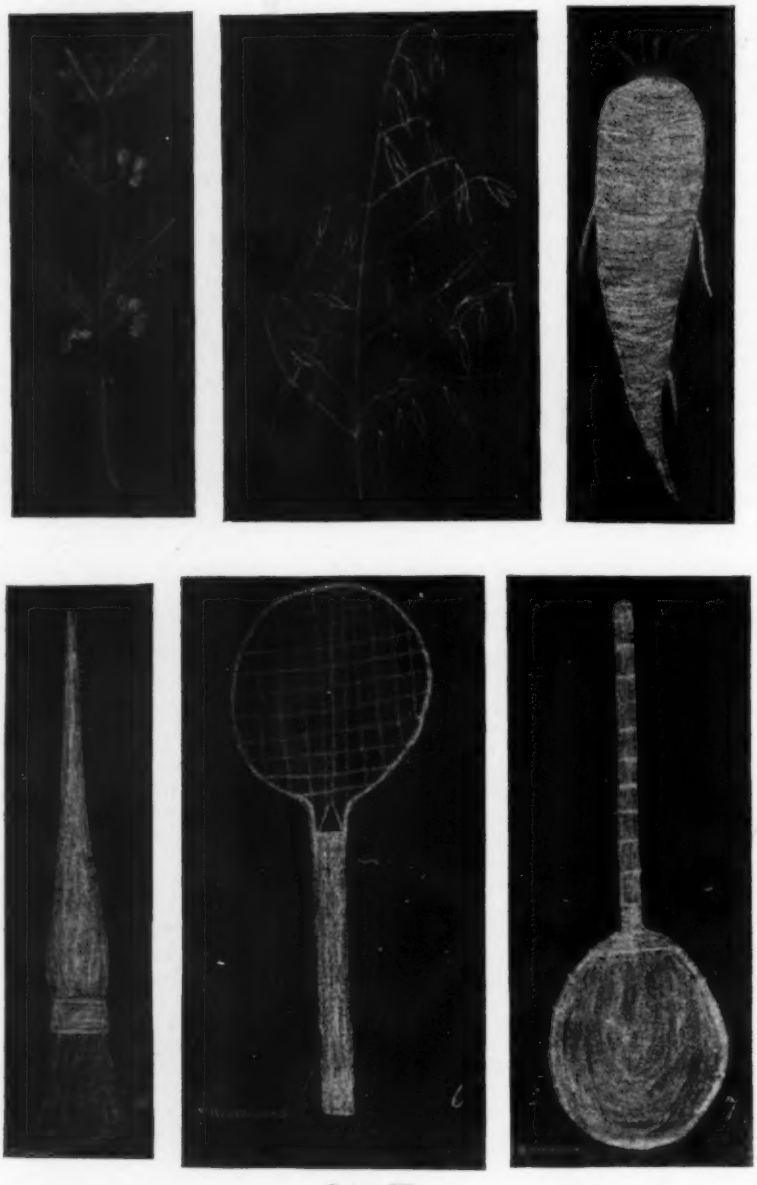


PLATE III.

placing before the class. The children are taught to rely on the eye alone.

Elliptical forms should not present any very serious difficulty. The way has been prepared for "height and width," while the actual drawing follows the method laid down for circular forms. It is not necessary to keep to one object until perfection is reached. If more practice is required, let the class have something similar in form, and interest will be kept up by the change.

As the children become more skilful, the preliminary questioning is concentrated on the object itself—its uses, why such and such a shape, etc.—rather than on the drawing of it; and they should draw things which will test whether they can appreciate slight departures from the regular form. The tennis racquet, for example, has the top and sides slightly flattened; an orange is not perfectly round, but flat at the top and bottom; and so on.

Nature drawing is very interesting work for the children, and a great help to the observation lesson. Leaves, flowers, and plants are the specimens generally selected, but occasionally a child will attempt a higher flight and draw a bird or animal. When all are drawing from different copies, the teacher's work lies more with the individual than with the class, but general features can be treated collectively. It is not necessary to *tell* the children much; direct their attention to certain points, and let them find out for themselves.

In drawing leaves, the direction and number of the serrations and veins are pitfalls for the unwary, but these simply require careful observation. The leaf is filled in by drawing from the edge to the midrib, following the direction of the veins.

Other handwork is provided for by plasticine modelling; pricking, sewing, and colouring; and in some years we add scrapbook making. For the second of these occupations we use cards, 8″ by 6″, on which the teacher hektographs a good bold drawing connected with the Nature lessons. After sewing over the outline, the card is coloured with crayon, generally from Nature. The woodcock, fieldfare, swallow, rabbit, fox, and squirrel are very suitable, as we have stuffed specimens, but there is a wide field to choose from.

The scrapbooks are made by cutting out the children's coloured illustrations of Nature lessons, and gumming them in brown-paper books. The page illustrating a lesson on corn would show an ear of wheat, a windmill, a sack of flour, a cottage-loaf. Work intended for the scrapbooks is done on white paper.

The drawings of toys on Plate I. are by children at the end of their first year. No. 1 is a clock-work porter, Nos. 5 and 6 are tin soldiers, No. 4 is an india-rubber donkey, No. 2 a motor car, No. 7 a motor boat, and No. 3 one of Mr. Kipling's "Just So" camels, the work of a little boy who knows the story well.

The drawings from objects and Nature on Plates II. and III. will give some idea of the work of Standard I. children.

ART AND THE BOOK.

PRINTED BOOKS.—I. BLOCK BOOKS.

BY W. E. SPARKES.

From Illuminated Manuscripts to Printing.

ILLUMINATED manuscripts did not die a natural death upon the introduction of printing. The new-born love of learning which spread through Europe in the second half of the fifteenth century caused a natural demand for more books than could be written by the professional writers; and from this eagerness to possess books, the wits of men began to cast about for a quicker means of producing them. But illuminated manuscripts continued to be produced for very many years.

It is curious that there is no certainty as to who was the first printer. Dutch, German, and French authors, carried away by patriotic pride, have all sought to trace the inventor to their own country; and in the midst of so much confusion one is tempted to believe that in all those countries (and perhaps in Italy too) the scribes were casting about to discover some mode of producing books more quickly. Even our own printer, William Caxton, twenty-five years after printing was firmly established in Europe, tells us that he was led to learn the art because, having translated the *Story of Troy* for Margaret, Duchess of Burgundy, it was so admired by his fellow English merchants at Bruges that, in mere friendship, he wrote out several copies as presents—a task he found growing more and more exacting. He determined to learn printing as an amateur. "I have practised and learned, at my great charge and expense, to ordain this said book in print after the manner and forme as ye may here see, and is not written with pen and ink, as other books be, to the end that every man may have them at once."

It will probably never be decided whether the Flemish merchant Coster, or the German Gutenberg, or another was the real inventor of printing, though most British authorities, at any rate, are inclined to give the verdict for Gutenberg so far as printing from *movable types* is concerned.

And here we enter upon another thorny path. Was printing from movable types the earliest form, or was there another? The authorities are all at loggerheads on this question too. Many will have it that *block books* preceded printing by movable types; many others assert the contrary. It would be out of place here to enter into the arguments for or against; it is, however, interesting to glance at these curious books which, chiefly by reason of their illustrations, must necessarily find a place in considering art as applied to the book.

Block Books: what are they?

A block book is one printed from a block. This statement does not take us very far, until we call to mind that the ordinary book is printed from many little blocks—that is to say, from types bound together in a compact mass. The maker of the block book, in fact, took a thick piece of planed wood, upon which, with a brush or a pen, he wrote a page just as he would have done if he had been a manuscript writer—with this exception, that all the lines were written from right to left, and each letter written backwards. The result can readily be seen by writing a word in thick letters, and then taking an impression of it, while wet, upon blotting-paper.

Having completed the page of this reversed writing on the block, the craftsman next proceeded to cut away the wood around every black outline, in order that the words might be raised above the portions cut away. If ink is dabbed over such a block, and then a sheet of paper pressed on the inked surface, the impression will read like the ordinary printed page.

Now, to cut letters satisfactorily demands very high skill, and in all but the very finest block books the results are not to be compared with the page printed from movable types. And, of course, the letters must be fairly large, since the slightest slip of the knife (for the engraving was really wood-*cutting*) would play havoc with the shape.

As might have been expected, this wood-cutting was the work of the earliest engravers; and block books generally consist almost entirely of pictures with lettered explanations. This leads naturally to another question: *Were woodcuts known before printing?* If they were, they would, as a matter of course, be copies of the pictures used in written manuscripts, or in stained-glass windows, or in wall paintings. Again there is no certainty; a'l the arts—wood-cutting, block-book making, and printing from movable types—appeared so close together in time that it seems impossible to separate them.

Perhaps wood-cutting (pictures) appeared first; but this is only a supposition. As I have pointed out before, in drawing attention to illuminated manuscripts, many monks as well as laymen were fine artists. The Chinese had, in very early times, found out the art of cutting pictures on wood and taking impressions on silk; such pictures may have found their way to Europe and given hints to the clever craftsmen to be found in every large city. Moreover, the monks had, long before this, recognised how powerful pictures are in their appeal. Their churches were crowded with symbols; carvings, paintings, and stained glass were permanent monitors, recalling the sacred story and leading the people to think upon what was so eloquently placed before their eyes.

And it was become the custom, either immediately before printing was invented or soon after that event, for the monks to distribute sacred pictures (woodcuts) to the people—pictures generally in outline, and roughly coloured in crude tones by hand. This practice long continued, and among the hundreds of early German and Flemish woodcuts in the British Museum, there are very many which were full of meaning to the unlettered people. These single sheets are often entertaining in our eyes—sometimes grimly humorous, sometimes horrible in their intensity, and sometimes very beautiful in suggestion. Shakespeare speaks of seven ages; the German wood-cutter more minutely divided life into ten ages, figuring each by drawings representing man from childhood to senility; and then, having inserted an improving verse, he drew below an animal which in his opinion agreed most closely with man's nature at stated times. Thus the man of forty is a

soldier—*his* animal is a lion; at fifty he is a prosperous merchant, with a fox for his type; at seventy he begins to wither, and a braying ass is considered fit symbol for his simplicity; while at eighty, nothing less than a goose can illustrate his mental state. A shrewd wit indeed!

Other sheets sold to the people illustrated the breaking of the ten commandments, with cheerful little cuts pointing out what might be expected to follow, among which showers of frogs and fire from heaven may be cited as minor events.

These are in most cases supposed to have been carved twenty, thirty, or more years after printing had become common, yet in many instances the lettering, as well as the pictures, is cut from the one block; they are, in fact, block *sheets*. It is quite possible that, before printing from movable types became known, such improving and moral sheets were common; but owing

A Page from the "Biblia Pauperum."

to their fragile materials, they have long ago perished. The later ones stored in our museums sometimes bear a date, or can be *placed* by their artistic style. They are all deeply interesting. When, however, several such sheets were bound, or pasted together, in forming a connected story, we have true examples of block *books*, some being among the most famous illustrated works in the world.

Before proceeding to call particular attention to one or more of these block books, it is well to mention that, for many years previous to the invention of printing, linen and cloth were frequently ornamented with patterns stamped from a wooden block. Thus, it is important to remember that although letters and pictures were not used, the first steps had already been taken. Mr. Dodgson of the British Museum makes a valuable suggestion—namely, that, as time wore on, paper hangings (wall paper) may probably have been stamped as a cheap substitute for stamped linen; so that not only had there been workmen skilled in cutting blocks for printing patterns, but they may have made these impressions on paper, preparing the way for block books with pictures and lettering.

Another point to be mentioned is the striking beauty of the colouring in some of the early block sheets representing saints and sacred characters. No doubt the illuminators, finding their business slipping between their fingers, were glad enough to get a living by colouring block sheets, using the same strong and rich harmonies of reds, blues, and yellows as had been their practice in illuminating manuscripts.

Moreover, among the hundreds of examples I have examined at the British Museum, I have seen some in which it is stated in block letters that the print came from this or that convent—generally from a convent which had become a place of pilgrimage, the priests and nuns making these sacred pictures a profitable source of income. And perhaps this fact accounts for the strong sincerity of workmanship and feeling even when the drawing is poor; and often enough the design appears to have been copied from a painting or an illuminated manuscript, though, of course, much is lost in trying to render fine brush strokes in lines which had to be cut out of a wooden block with a knife.

Two Block Books—1. "Biblia Pauperum;" 2. "Mirabilia Romæ."

The *Biblia Pauperum*, or the *Bible for the Poor*, is now generally believed to have been first printed at least twenty years after printing with movable types had become common; though, as I have mentioned above, some authorities believe the book to have preceded such printing. It is, perhaps, the most famous block book in the world. I have examined three copies at the British Museum. Two are very similar. These are supposed to be the first editions in its printed form. The third is a dreadfully crude attempt to copy the finer edition; and there are others which vary considerably in handicraft, though the subjects are the same throughout. For this was a favourite book from very early times; it existed in manuscript, with illustrations, probably from the ninth century. One is not, therefore, surprised to find the *Biblia Pauperum* among the very first books printed from engraved blocks. It is a book intended to convey its meaning by pictures, which have always appealed with such direct force to the people. Some authorities are inclined to think that the full title should be *Biblia Pauperum Prædictorum*—the Bible of Poor Preachers—believing it to be a text-book used by poor preachers, who were unable to call the attention of their flocks to the expensive, beautifully illustrated illuminated Bibles cherished in the richer monasteries.

The earliest edition (from which our example is taken) consists of forty pictures, each about the same size as a page of the *Practical Teacher*. They are drawn to a common plan—that is to say, there are three illustrations in the middle of the page, and above these pictures, and also below them, are two so-called portraits, representing prophets who had foretold incidents in the life of our Lord; while in the corners and on scrolls are a few words in explanation.

Let us look at one page as an example. I would point out, in the first place, that the central picture on each sheet is concerned with an incident in the life of Christ—the first showing the birth at Bethlehem, the others following the sacred story in order, until on the last we see our Lord seated in glory.

A Page from the "Biblia Pauperum."

The one I have selected is the twenty-ninth of the series. It shows the moment of resurrection from the tomb. Then it is to be noted that the picture on either side shows some incident drawn from Old Testament history, supposed to be a *type*, or foreshowing, of the fact recorded in the central picture.

Thus Samson on the left hand is seen carrying away the gates of Gaza, which his enemies had closed, intending to slay their enemy in the morning. In the section above his head is a Latin inscription. (The fact that Latin was employed in a book issued probably in the Netherlands is one reason why some writers look upon the book as intended for preachers, since Latin would be unknown to the people.)

This inscription is difficult to read, but it appears to say that "as it is written in the xvith chapter of Judges, Samson, by his strength, bore away the gates of the city in the middle of the night; and that this represents Christ, who, rising at midnight, broke down the doors of His sepulchre and came out." Under the picture of Samson are the rhyming verses: *Obsessus turbis: Sampson valvas tulit urbis* (Pressed upon by crowds, Samson bore away the gates of the city).

On the other side Jonah is seen rising from the belly of the whale, and the explanation is duly given above to this effect: "It is written in the second chapter of the prophet Jonah that, having been carried by the whale three days and three nights, he was cast up upon dry land; and so Christ rose from the grave after being three days in the sepulchre."

And beneath the picture one reads: *De tumulo Christe; surgans te denotat iste* (This man rising denotes thee, O Christ, rising from the tomb). Standing each within his niche are David, Jacob, Hosea, and Zephaniah, as may be seen by the names inserted in the scrolls issuing from each niche. The words after each name are quotations from their writings or sayings, all supposed to refer to the coming Messiah. Then, as a general title and a reference to the central picture, the phrase at the bottom of the page is written in larger letters: *Quem saxum texit; ingens tumulum Jesus exit* (The mighty Jesus whom the stone covered rose from the tomb).....

How curious it all looks to modern eyes! The wonderful headgear and strange costume, so different

from what later art (influenced by the Italian artists) has accustomed us to expect, are yet quite in keeping with what we have seen in considering illuminated manuscripts. For in them the illuminist, quite naturally and as a matter of course, dressed the sacred personages in the garb worn by the people about him. There was nothing incongruous to him in drawing Roman guards armed like Flemish knights, or Samson, David, and the rest in the astonishing costume common to merchants and burghers; while, as to architecture, why should an artist hesitate to draw a walled city with pointed turrets, or to place the prophets under Gothic arches, though the scene is set in Palestine?

Every page was crammed with meaning and allusion. The man unable to read could purchase the *Biblia Pauperum* for a small sum from a preaching friar, who would explain the story and its bearing. The book became a permanent possession and speaking monitor. For though the appeal would be slight to us, accustomed as we are to rich paintings, the *Biblia* must have strangely moved the poor, who for the first time in their lives owned a book which had been produced by the wonderful new art, printing. And though the woodcutting was rough, the original drawings on the block must have been more than merely passable; probably indeed the handwork of an accomplished illuminist.

Most block books were similar to this *Biblia*: there were many pictures and little letterpress. But it would be a mistake to think the old engravers were limited to that extent. The block, having once been finished, was ready for unlimited use. Unlike the printed page from movable types, there was no breaking up and distributing after one edition had been printed. The demand for another edition might come at any time; and if it were likely to be a popular book, there would be a considerable saving of time and expense by having the solid blocks ready at hand. This is why even so late as 1530 block books continued to be used.

A Page from the "Mirabilia Romæ."

The "Mirabilia Romæ" (1475).

This is an instance in proof. German printers had carried their art to Rome as early as 1467; yet, although very many beautifully printed books had issued from the press in that city, here is a remarkable block book produced in 1475; and very probably many others, now lost, came from Rome as from other cities.

The *Mirabilia Romæ* (The Wonders of Rome) is a guide-book in German, printed at Rome for German pilgrims—a primitive Baedeker. Its 184 pages, for the greater part letterpress, are all cut from the block. It must have appeared a very poor affair to eyes accustomed to printing from movable types, for, as I shall show shortly, nothing is more remarkable than the exceedingly fine printing which issued from the very earliest presses.

But look at these rough-hewn characters and ill-drawn figures and ornaments. The letters themselves are as irregular as you might expect from a novice in handwriting. Yet the book served its purpose. It is small, and was probably inexpensive. One thinks with pleasure of the German pilgrims drawing their guide-books from their wallets and marking down one by one the wonders of the ancient city, to be retailed to their less fortunate countrymen on their return home.

It will be seen at once that this curious block book reproduced initial letters with their ornaments trailing down the page, as had been the practice in illuminated manuscripts. Moreover, the affection for manuscripts led to these figures and ornaments in printed books being coloured, so beautifully in the best examples that one can hardly distinguish them, at the first glance, from initials drawn as well as coloured entirely by hand. Indeed, illustrations were at first intimately bound up with the page. A later and worse taste separated text from illustration to such an extent that, in very many modern instances, the page would look far more artistic if the picture were omitted, simply because the artist and the printer work with no attempt to make the type suitable to the drawing, or the style of drawing harmonious with the type.

Even in this rough *Mirabilia* the thick outline of the figure and the distribution of the curious ornament in the initial S agree admirably with the short, fat black letter. One of the chief beauties of Italian and French

books, for the first fifty years after printing had been introduced into those countries, is the fine taste that led the artist to consider the type with which his engravings were to be associated on the printed page.

A glance at the *Biblia Pauperum* and the *Mirabilia* is sufficient to mark a striking difference between them. The letters in the former appear to be broken in many instances across their face, as though the wood had been chipped away. This may well have happened in some instances, but that would not explain all the apparent accidents. Probably the *Biblia* was printed *without a press*. The engraved block would be placed flat, and then, after a thin ink had been dabbed over it, a blank sheet would be pressed down evenly on the block. Vigorous rubbing with a thick pad, or *frotton*, would cause the block to leave an impression—a method that would often "crinkle" the paper here and there. In those parts the impression would not show, so that the letters would look broken.

Even after a lapse of more than four hundred and fifty years the polish on the back on each page produced by this vigorous rubbing is still very evident on one *Biblia Pauperum*, in the British Museum. The *Mirabilia*, however, must have been printed in a press.

LEAF ATTACHMENTS.

BY AGNES E. FARMAN.

RUSKIN says in *Modern Painters:* "The leaves of the herbage at our feet take all kinds of strange shapes, as if to invite us to examine them. Star-shaped, heart-shaped, spear-shaped, arrow-shaped, fretted, fringed, cleft, furrowed, serrated, sinuated; in whorls, in tufts, in spires, in wreaths, endlessly expressive, deceptive, fantastic, never the same from foot-stalk to blossom, they seem perpetually to tempt our watchfulness, and take delight in outstripping our wonder."

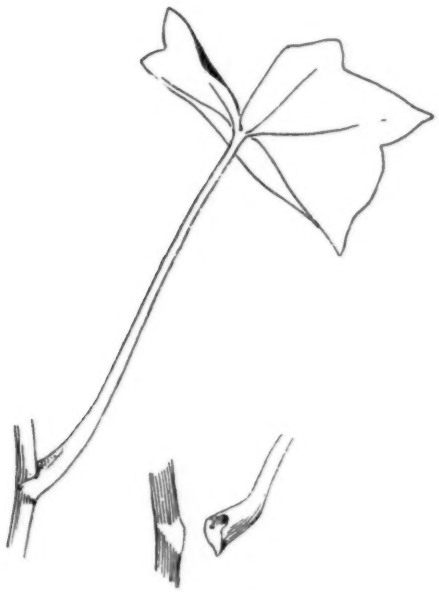


FIG. 1.

FIG. 3.

This description is in itself answer enough to those who are apt to reject a branch or spray as hardly worth drawing, because it is "only leaves." In leafage alone there is a wealth of material for use in all classes and at all seasons. It is true that children are most attracted by the colour and fragrance of flowers, but they can easily be taught to appreciate the beauty of form in leaves, and to be interested in their endless variety.

The drawing of leaf sprays should be preceded by preliminary exercises in single leaves, care being taken that the leaf-stalk is not detached from the stem, so that each child's attention may be drawn to this most important detail of leaf drawing. On page 250 are several examples. It will be found that the ways by which leaves contrive to hold on to their stems are almost as varied as the forms of the leaves themselves. At times the stalks are simply enlarged in order to obtain a broader area of attachment, or the end is hollowed out to give a firmer grasp round the stem, as in the ivy (Fig. 1) and chestnut (Fig. 2). Often outgrowths or stipules wrap round the whole or part of the circumference of the stem, as in the chervil and clover on page 250. At times the leaf-stalk is altogether absent, and the leaves themselves embrace the stem, as in the tulip, doronicum, and iris. In the perfoliate honeysuckle the leaves look as if two had grown together.

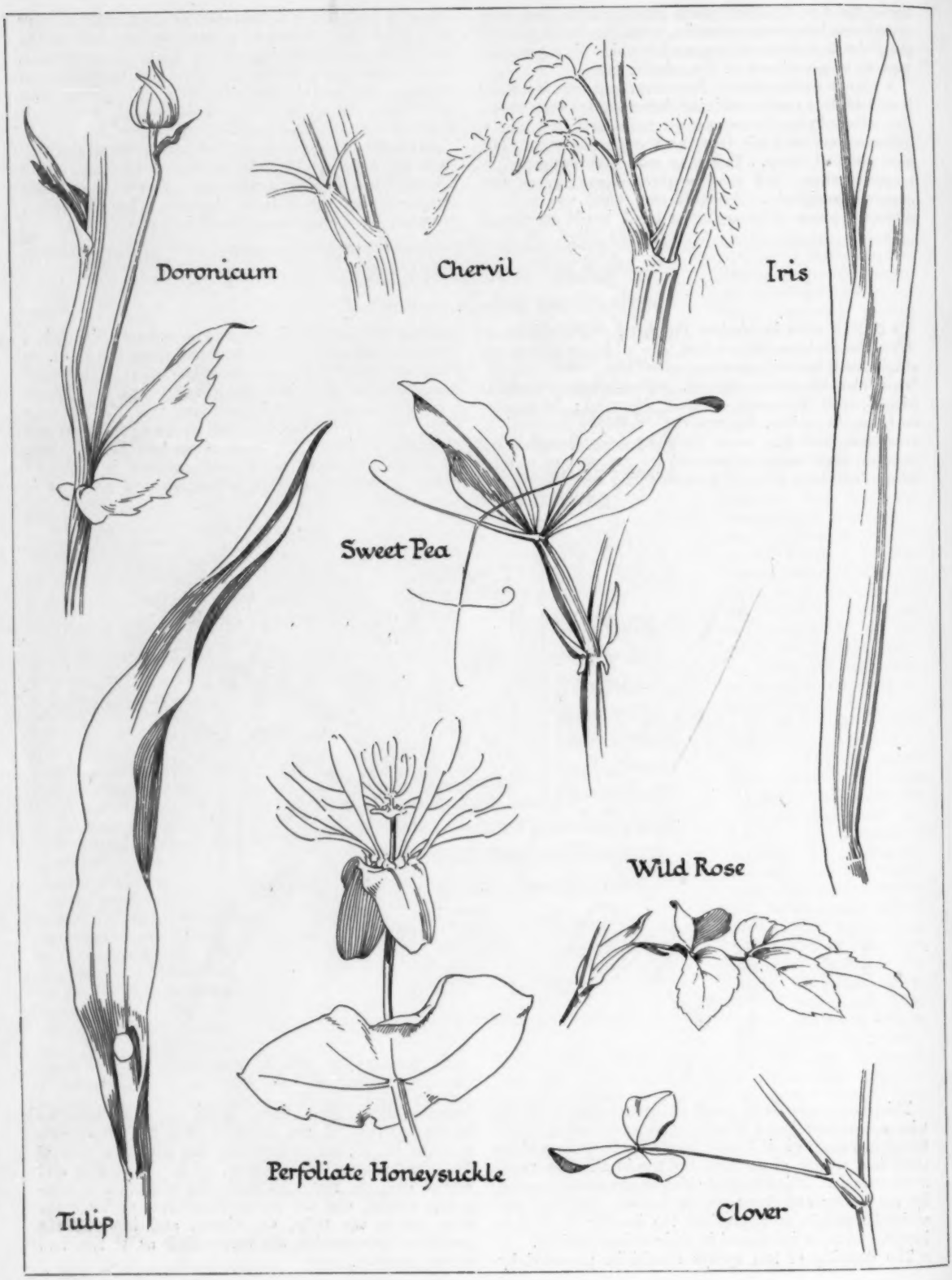

Doronicum
Chervil
Iris
Sweet Pea
Wild Rose
Perfoliate Honeysuckle
Clover
Tulip

Fig. 2.

These variations are not accidental, but are all connected with the general development of the plant, and give character to it.

In connection with the preliminary exercises it will sometimes be found useful to cut off the mass of the leaf and let the drawing be practically confined to the mode of attachment (Fig. 3, Variegated laurel). Too much stress cannot be laid on the importance of details of this kind, to which children, as a rule, pay little or no attention. Not only will their eyes be opened to the minuter beauties of form in plant life, but their powers of observation of the less obvious facts will be quickened and intensified; and when more elaborate studies of sprays are given, it will be found that the time spent on the preliminary exercises has not been wasted.

THE HISTORY LESSON AND DRAWING.

COSTUME.

BY W. H. ELGAR.

MORE than once the difficulties attending these historical studies have been referred to in these papers; but nowhere else do these difficulties seem so numerous and formidable as in our present subject. The scarcity of representations, to say nothing of actual remains, with their usual inaccessibility, and the small number and high price of really reliable works upon costume are but the beginnings of troubles.

Then large numbers of illustrations in our historical readers, some even by eminent artists, are very incorrect in details of dress. It should, however, be remembered that, until comparatively modern times, it was customary to represent all persons in pictures, carvings, engraved gems, enamels, etc., in the costume of the time in which the work was done, excepting apostles and sacred persons, who are clothed in that of the early Christian age, or as near as the artist could get to it.

No harm can be done by considering for a moment the difficulties surrounding the teacher who desires to make the history lesson more realistic. Nothing is ready to hand save the history readers, his own notes and text-books, and perhaps a few more or less imaginative wall pictures. Small wonder some go-ahead members of the profession have sought to give reality by letting the scholars act some of the events they wish to teach. The limit of this kind of thing is sooner or later reached, while very erroneous ideas as to periods and settings are liable to creep in. It is just possible that before long, in the study of such subjects as history, we shall return in some measure to the old method of storing the mind with a framework of facts upon which to build subsequent studies.

Some, too, have endeavoured to create an atmosphere by setting aside a room for history, having pictures, diagrams, plans, etc., arranged in various ways upon the walls. Here we are met with the difficulty mentioned above—that of obtaining reliability.

When we remember that all too many of these reli-

able records of costume are flat, the difficulty of finding suitable drawing material will in some measure be understood.

Probably the first thing to do is to get some general ideas from guides and handbooks, like those of the British and South Kensington museums. These are most reliable, being written by authorities of no mean order. Then, if the teacher explores his neighbourhood armed with this knowledge, most likely something will be discovered. Afterwards the pupils can tread in their leaders' footsteps.

As all these difficulties have been experienced by the writer, it may very likely be interesting to give a short *résumé* of English costume, and illustrate it with representations collected by him, followed by a few suggestions as to creating an interest in children. Our remarks will apply almost exclusively to the dress of the higher classes, for during the Middle Ages that of the poor man remained very similar, and consisted of a girded tunic almost to the knees, a tight covering for the legs, and a cloak or mantle in winter; while poor women wore very simple clothes, which interfered as little as possible with free movement when working. Sketches of such dresses were given in the paper referring to the Norman Period, and were taken from the carvings on the west front of Lincoln Cathedral. Further examples of this period can be obtained from various ivory carvings found in museums (especially the British Museum), and on buildings of late Norman date.

Probably in some measure due to Eastern influence, tunics and mantles of the higher classes grew very long during the twelfth century, and the ladies wore long, loose garments producing numerous folds. The beginning of the thirteenth century saw a reaction, and free movement became much easier owing to garments being cut shorter. Men and women both wore their hair long; their garments were much alike; and, considering that men often were clean shaven, and that the skill of the artists was not always of the highest, it is no wonder that we sometimes mistake one sex for the other.

For illustrations of these changes there is probably no better or more accessible material than the carvings upon many of our cathedrals—as Wells, Salisbury, Exeter, Lincoln, Lichfield, Durham, and Westminster Abbey. It is interesting to note that generally the heads on corbels (brackets) are earlier than whole figures, that the folds on the early figures are more regular and flatter than the later, and that most figures are very tall. There are reasons for all these facts, which we cannot discuss; but it may be noticed that our modern art students often commence the serious study of the figure with the head, and leave drapery for a later period.

Fig. 1.

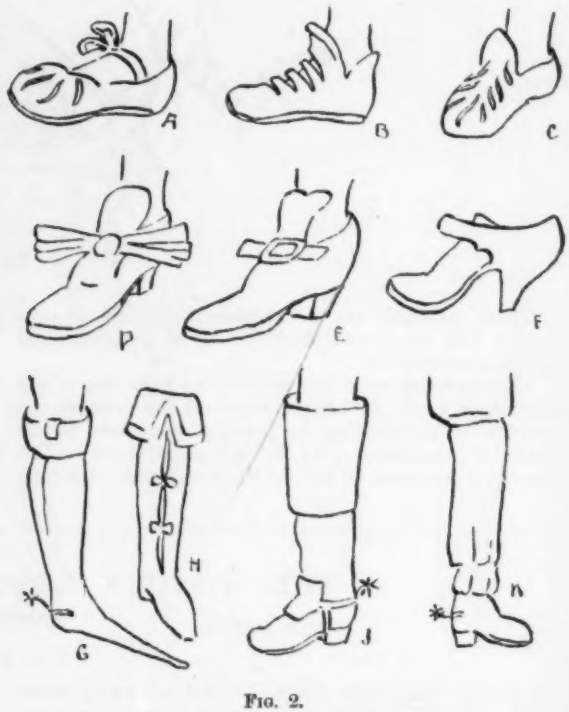


Fig. 2.

As a further illustration of this early costume a drawing of a piece of a fresco of late twelfth-century date in St. Gabriel's Chapel, Canterbury Cathedral (Fig. 1), is given, because it is not accessible to the general public, and is almost unique. It represents Zacharias seated in a chair, decorated in an architectural manner, writing on a scroll, "His name is John." In front of him a man is making signs to the old priest, whose dumbness is expressed by the omission of a mouth, while behind are two persons, evidently much surprised. The drawing may be taken as fairly reliable—the writer knows of no serious faults, and it is as good as the means at his command allow. Attention might be drawn to the highly-decorated shoes, the hat

sitting so lightly on the priest's head, and to the peculiar way of expressing folds. It is not likely that the artist worked directly from models, and consequently his painting is an unmixed record of his general and to a large extent permanent graphic memory. This fact makes such paintings as this most interesting just now, when we are overhauling our methods of art instruction.

One great peculiarity of the Anglo-Norman ladies' dress was the rage for lengthening almost every part. This seems to have begun with the sleeves, which were tight to the wrist, and then suddenly widened and lengthened; and to have reached its climax in the time of Henry I., when these pendants were often knotted, forming a kind of bag. The hair being made in two long plaits added to the general tail-like effect.

As illustrations of the dress of these early periods are largely confined to those found in valuable manuscripts, there seems to be no other way but to take graphic notes from books, and compare them with the originals when visiting our great museums. No elaborate *facsimile* of the pictures should be attempted, as our object is simply the acquisition of knowledge; but the simple reading about and looking at pictures is not enough to make a lasting impression on the mind. When once this simple graphic note-taking is commenced it is rarely entirely relinquished, and becomes as much a part of ourselves as writing. The boots and shoes shown in Fig. 2 form a page of notes taken from various works on costume.

When studying particular periods, it perhaps would be well to set one or two pupils collecting notes of shoes; others hats; methods of dressing hair and beard; or studying the costumes of different ranks. A great deal of work is often done by assigning special tasks in this way.

Perhaps it is just as well to refer to these sketches of shoes at once. Sketch A, Fig. 2, is of the reign of Henry VIII., and represents the bear's-paw form, which was repeated in the armour of the period (see paper on armour in April *Practical Teacher*). The slashed shoes, B and C, followed the bear's paw in James the First's time. Buckled shoes of Charles I. and William III. periods are marked D and E. A super-elegant shoe of the reign of George I. is sketched as F. Four phases of the top boot are given in G, H, J, and K, the first two being examples of some of the extravagances of Edward the Fourth's time, J that of Elizabeth, and K of Henry VIII.

More detailed drawings are Figs. 3 and 4, of which the former is one of the reputed relics of Thomas à Becket. It certainly is a good specimen of a medi-

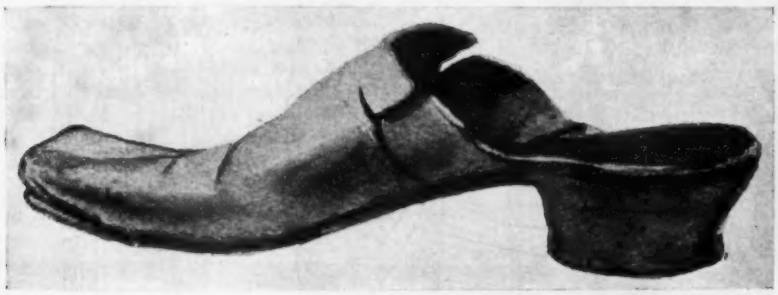


FIG. 3.

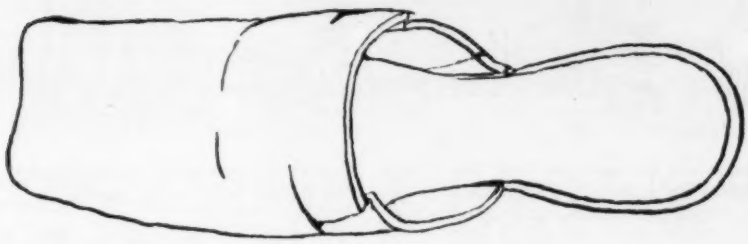


FIG. 4.

æval shoe, and as such the plan and side elevation are given in the hope that they may be useful to any one who wishes to model one in clay.

Fig. 4*a* is a drawing of a shoe said to have belonged to Archbishop Walter. Its simple form and much-decorated upper, quite in the style of his period, make

FIG. 4*a*.

this a more useful study. (Archbishop Walter crowned King John and his queen in Canterbury Cathedral at Easter 1201.)

Most of the remaining illustrations to this paper are reduced from rubbings of brasses. The rubbings vary much in size and clearness, and if reproduced as such

would make a very irregular show. For this reason they have been reduced to a uniform size, with the help of a camera lucida, so that their details may be taken as reliable; at the same time they appear in black instead of white line—a much nearer approach to the effect of the brasses themselves.

work (orphreys) down the centre and on the borders. Round the neck (Fig. 5) is seen the *amice* (a kind of hood), with its decorated (apparelled) collar or border; and showing below the *chasuble* is the *alb*, a large white undergarment, apparelled, with a panel at the bottom. The two ends of the *stole* appear in front of the *alb*, and

5 6 7 8 9

No military figures are included, as they have been treated in our articles on armour. There are four examples of priests, three merchants, and all the rest are ladies.

It will be impossible to call attention to a tithe of the interesting and valuable details of these; but in general the position of the hands should be noticed, the earlier ones being closely pressed together, the later turned sideways and loosely pressed. The folds at the base of the skirt are often very beautiful, and show the skill and feeling of the artist at a very difficult place, as one soon discovers when attempting to design such figures. Some of the brasses illustrated are small, rough ones, from out-of-the-way villages, and others are from splendid examples at Westminster and other places. Consequently, the work is very uneven, hands and heads being very large in some, and the features out of all proportion to the faces.

Some slight reference to the vestments of priests prior to the Reformation was made in the May number of the *Practical Teacher*, when describing a half figure. Fig. 5 shows a priest of about 1500 A.D. in the ordinary dress used when officiating. The brass is small, 10½ inches high, very rough, and out of proportion, and probably a type of many to be seen in village churches.

The large cloaklike garment coming to a point at about the knee level is the *chasuble*, which in its original form might be described as a circular garment with a hole for the head to pass through. That of Thomas à Becket preserved in Sens Cathedral seems to be of this form. This chasuble is severely plain, but that of John Estney, Abbot of Westminster, who died in 1474, and was a patron of Caxton (Fig. 7), has beautiful needle

that of the *maniple* hanging from the left arm. Between the hands is a vessel meant for a *chalice*, but badly drawn.

As Abbot of Westminster, John Estney (Fig. 7) turns the crook of his pastoral staff *outwards*, showing that his authority extended beyond the walls of his abbey. Most

10 11

abbots' brasses show the crook inwards. Other points to notice are the little banner (*vexillum*) hanging from the staff, the richly-decorated mitre, and the dalmatica, a garment appearing below the chasuble. Deacons wore the dalmatica when at mass, and bishops used it under the chasuble, thus in a way uniting the vestments of priests and deacons in their own. The abbot's right hand is raised in blessing, the two first fingers being extended, and the other two bent, showing plainly the large ring on the second finger.

Both these figures are represented in eucharistic attire, whereas Fig. 6 gives us Thomas Aileward, Rector of Havant, Hampshire, 1413 A.D., in processional vestments, of which the principal is the *cope*, a cloak furnished with a hood, and secured across the breast by a clasp or *morse*. The straight edges down the front are magnificently embroidered with *orphreys*, and the hood is of fur (*almuce*, or aumuce), to protect from cold in processions. Under the cope is worn a *surplice*, a kind of alb, ample flowing, and the forerunner of the surplice of the present day. The famous brass of Prior Nelond at Cowfold, Sussex, 1433 A.D. (Fig. 8), gives an excellent representation of a mediæval surplice.

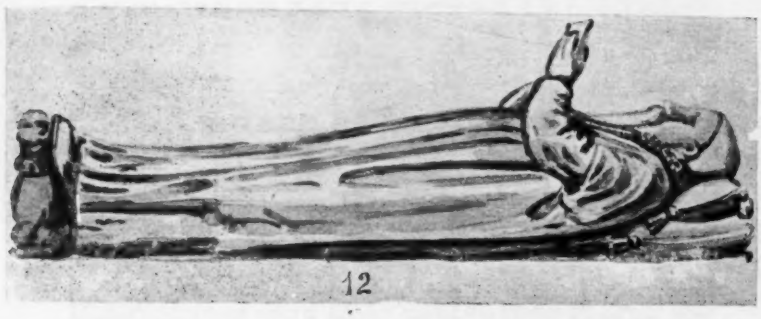
It is not the province of these notes to criticise, but so many of the paintings of the murder of Becket (even one, not ancient, secured to the wall of Canterbury Cathedral, and repeatedly shown to visitors) represent the archbishop in a chasuble, which would only be worn at celebration, that it seems necessary to call attention to such errors, especially as what Becket wore on that occasion is well known, and has been pointed out by Dean Stanley in his memorials.

We now take four typical figures of the merchant class—Figs. 9, 10, 11, and 12. No greater contrast could be well given than that between Figs. 9 and 11—one being beautifully proportioned, designed, and executed, and the other altogether wanting in these qualities.

Strange to say, the best is the earliest in date (Fig. 9), showing William Grevel, "Flos mercatorum Angliæ," from his brass in Chipping Camden, Gloucestershire. The date is 1401, and we see the pointed shoes, the long gown neatly buttoned down the front, confined at the waist by a decorated belt, from which hangs an *anelace*, a short sword or dagger. A long cloak is buttoned at the shoulder, and the backs of the hands are protected by the prolonged sleeves of an undergarment buttoned tightly at the wrists. The head shows close-cropped hair, and short peaked beard.

Fig. 10 represents Peter Fyge, a London merchant of the middle of the fifteenth century, and shows well the short cloaklike gown, confined at the waist, and the very full sleeves, which allow the undergarment to show at the wrists. The long pointed shoes also appear in this figure, which not only gives a good idea of the dress, but is typical of many small brasses of the times.

We are reminded of the dresses seen in some of Holbein's pictures by Fig. 11, which exhibits the long fur-trimmed cloak with full sleeves, the blunt bear's-paw-shaped shoes, the clean-shaven face and long hair, extremely well for such a clumsy piece of work. The date on the brass is 1520.



12

Our twelfth illustration is taken from an effigy in Ashford Church, Kent, and represents the founder of the great family of Smythe, Customer Smythe, who was Comptroller of the Customs in the reign of Elizabeth. His gown is ample and long, the sleeves are comparatively close, the shoes are narrower than those of Fig. 11; he wears a close-fitting cap, and a collar which proclaims the date unmistakably, while his ample beard is quite a change from the clean-shaven chin of his predecessor.

So much space has been taken up with this absorbing subject, now more studied than ever, as the many pageants show, that the consideration of the dress of ladies must be postponed for a second part.

NEEDLECRAFT FOR PRIMARY AND SECONDARY SCHOOLS.

BY ANN MACBETH AND MARGARET SWANSON, INSTRUCTRESSES AT THE GLASGOW SCHOOL OF ART.

PART IV.—(*Continued.*)

EITHER as adolescent, or as adult, in extension or continuation classes, every girl and woman who is able to write her own name should be able to design simple pattern, which will give added decoration to the work which she constructs; with which we have so far dealt.

Every individual written signature is an original design based upon certain alphabetical forms, and each woman or man should thus realise that it is equally possible for her or for him to make designs in a simple

way based upon certain other forms known to them. For example, if we take the letter O and the letter I, we can make a pattern thus—

IIIIOIIIIOIIIIOIIII

or the letters C H, thus—

CHOCHOCH

or in cursive hand, *e* and *l*, thus—

leeleeleeleeel

In fact, to repeat any one or two forms in a certain order will produce pattern.

Probably our most primitive ancestors produced pattern by making strokes with a sharp stick in clay, and this method of decorating plastic materials obtains to this day in all potteries; and practically similar in style are the equally primitive beginnings of design for needlework, consisting of arrangements of stitches of either units or groups in one or more colours, examples of which we have given at the most elementary stages of this course. These examples may be introduced with excellent decorative effect into the most advanced student's work.

It is well for the beginner in design to confine her motifs in her decoration to one or two simple geometrical forms at most, such as can be drawn quickly and easily by means of a ruler on lined paper, since every method of saving time should be encouraged.

We will take, for instance, a simple square form, shown in last month's number—Diagrams 55, 56, 57. These designs are entirely based upon square forms, and might without difficulty be cut out of the material and placed correctly without any preliminary sketch, if care be taken to faithfully follow the thread of the material and to measure distances by means of folding. Diagrams 63 and 63*a* are variations of the square form, showing how a simple leaf may be adapted to the general quadrilateral shape.

An easy way of producing a correct repetition of such a form is to cut it out in stout paper, which may be placed on the material and traced round with a pencil.

DIAGRAM 63a.

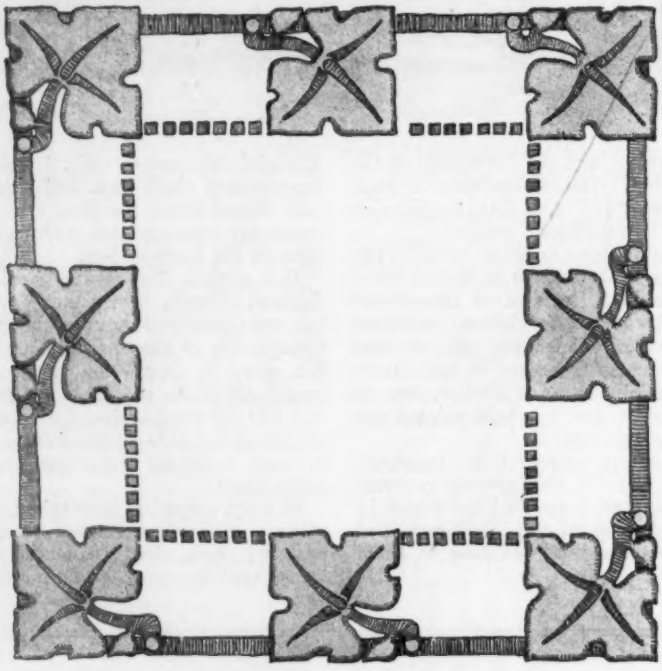
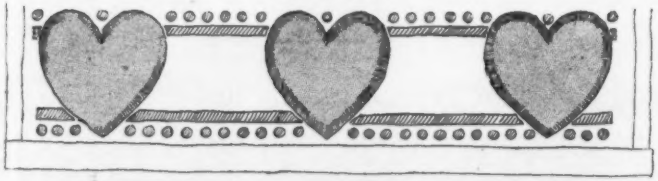
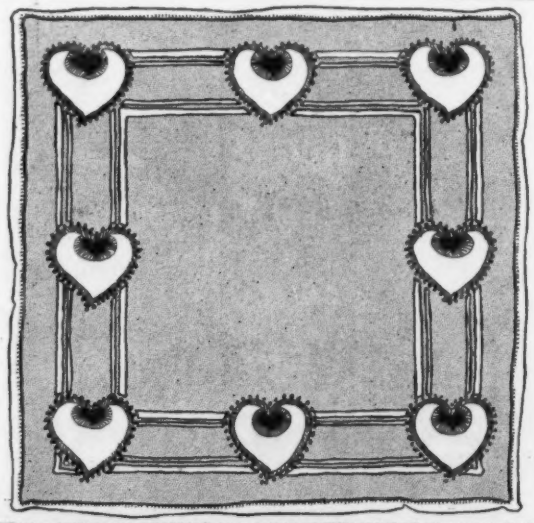


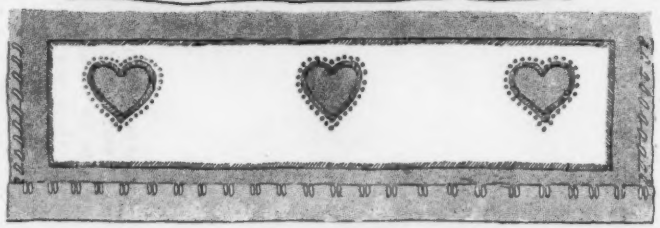
DIAGRAM 63.

DIAGRAM 64.

DIAGRAM 65.

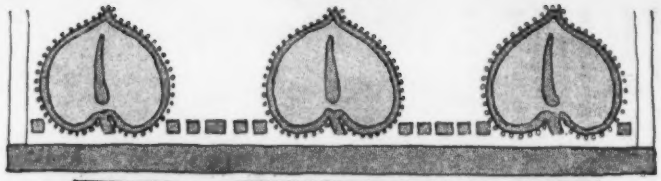






DIAGRAMS 66, 67.

DIAGRAM 68.



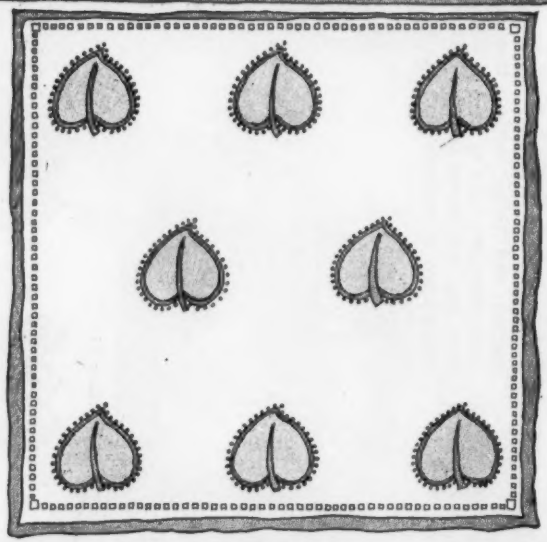


DIAGRAM 69.

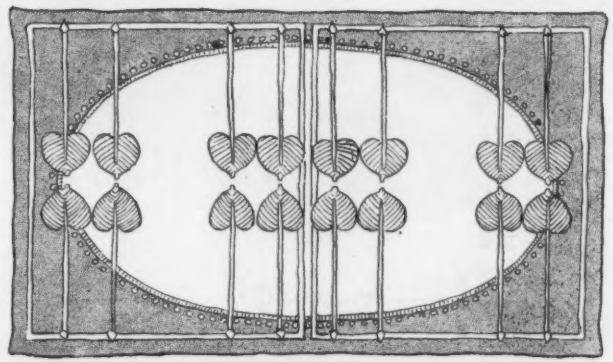


DIAGRAM 70.

Diagrams 64, 65, 66, 67 are based on the heart shape, and are suitable for borders and cushion squares.

These have been very successfully carried out in linen appliqué.

This form inverted is likewise the basis of the designs shown in Diagrams 68 and 69.

The first of these makes admirable decoration for such things as require a simple and weighty border of ornament.

instead of the leaves, which may be sewn in satin stitch. Diagram 71 shows a cosy based on the same, with the addition of semicircular lines, which should be drawn with a pair of compasses.

Diagrams 72 and 73 illustrate borders suitable for runners and toilet cloths. Diagram 74 has added decoration by means of rows of darning, where threads have been withdrawn and then coloured threads woven into a braid by ordinary darning.

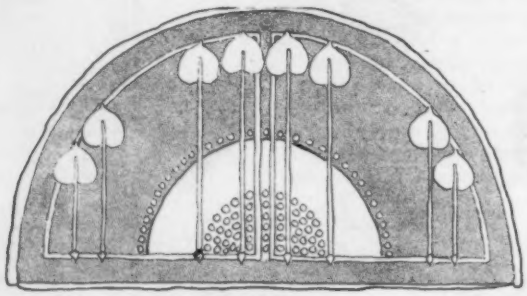


DIAGRAM 71.

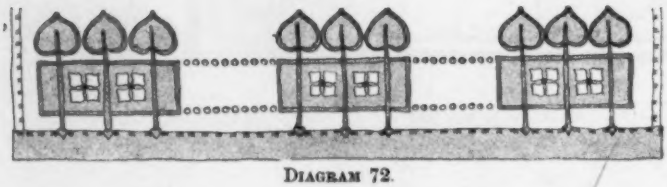


DIAGRAM 72.

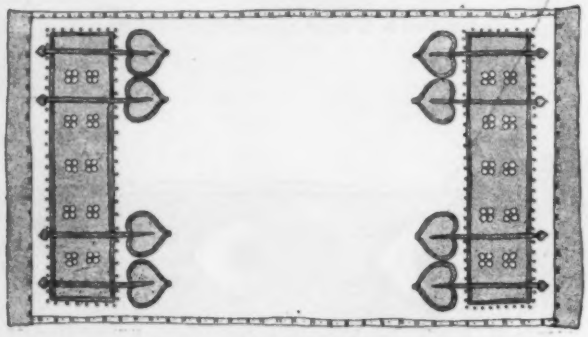


DIAGRAM 73.

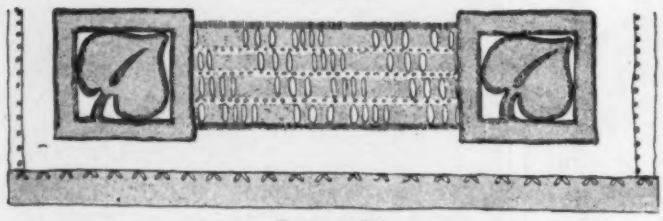


DIAGRAM 74.

In connection with the value of this illustration, where *weight* and *strength* are given by simple decoration, it comes to be "realised that in needlework, as in other things, there are a few definite principles which are the basis alike of the most artistic handicraft and of the simplest garment" (Circular 719).

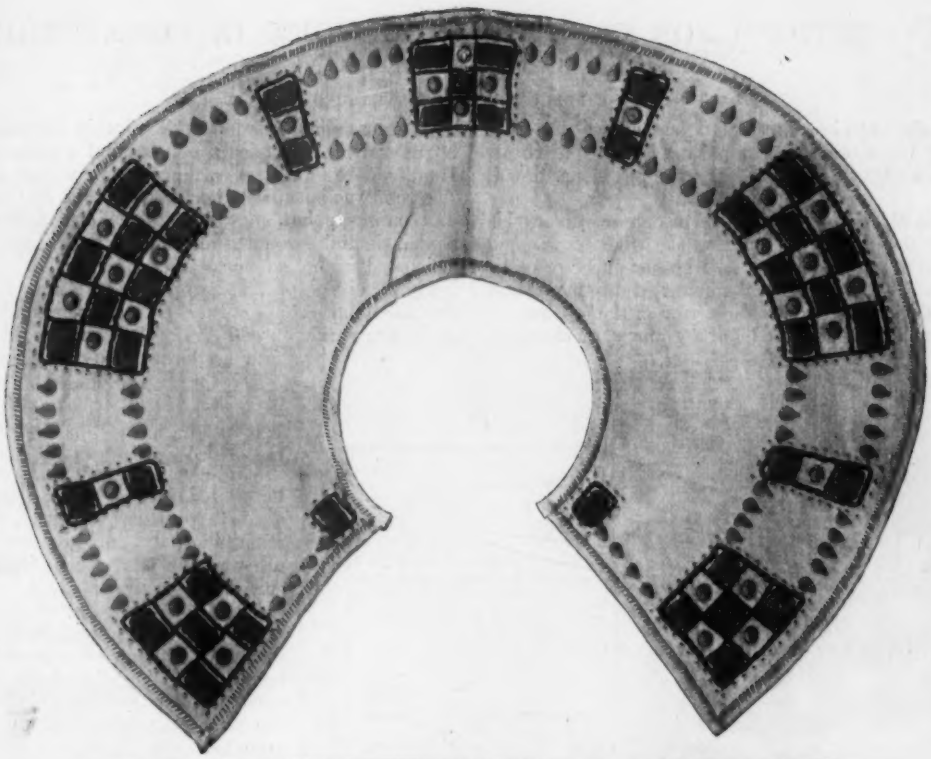
Diagrams 70 and 71 are also carried out in linen appliqué, the oval form in Diagram 70 being applied

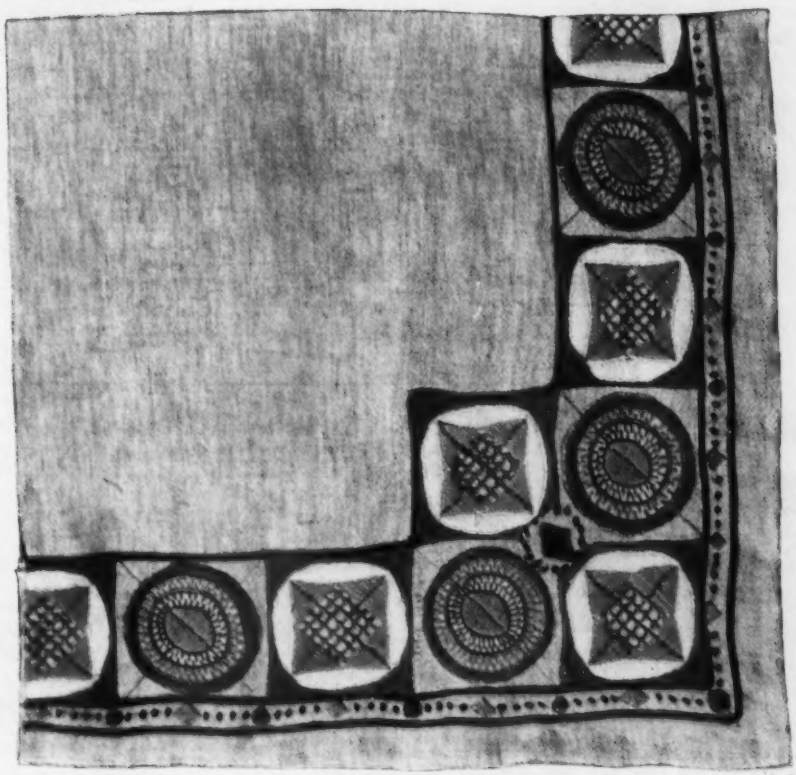
Diagram 75, on the coloured page, shows a collar with simple geometric pattern, suitable for blouse or coat.

Equally suitable, sewn in all white, the collar forms charming decoration for the neck of a nightdress.

Diagram 76 illustrates a gray linen table-cover sewn with ordinary mending yarn in shades of blue, mauve, gray, and touches of black.

(To be continued.)





Diagrams 75, 76.

SUGGESTIONS FOR CONSTRUCTIVE WORK IN CONNECTION WITH OBJECT LESSONS.

BY FELIX T. KINGSTON, BARRY.

FROM the exercises illustrated herewith a selection may be made to accompany a lesson on wheat, or on some cognate subject—for example, flour, bread, baking.

Notes on the Figures.—All dimensions are given this month in the metric system, for the sake of variety. The choice of material—that is, whether paper or cardboard—and the character and amount of ornamentation of the models are left to the discretion of the teacher.

Fig. 1*a* will serve as a model of a granary, an elevator, or a flour-mill. It was made of thin coloured cardboard, with small pieces of coloured gummed paper, 1 cm. square, stuck on to represent door and windows. The roof was constructed separately, Fig. 1*b*; the floor was omitted, but may be added if desirable. The model, including both roof and floor, may also be developed from a single piece of card.

FIG. 1.

Fig 1b

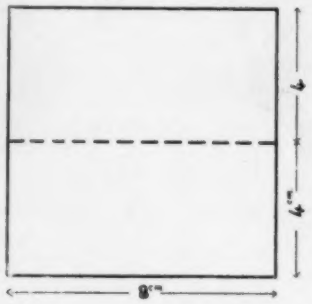


Fig. 2, model of a millstone. In working this exercise the children will learn that the circumference of a circle is approximately $3\frac{1}{7}$ times the diameter; if already familiar with this fact, the pupils can be led to suggest dimensions for the exercise. For this model carton paper was used. First, the band AB is glued up to form a ring. Note that the vertical line at B is *not* to be scored. Parts of the band (as shaded) must be cut away, that the remaining parts may not overlap each other when bent into position to receive the two circles, X, Y.

Fig. 3, a baking-tin, or might represent a baker's dough-trough. The model was made of coloured cardboard, its sloping edges being fixed by means of coloured cloth binding, and the remaining edges bound with the same material.

Fig. 4, a biscuit tin. This was constructed in carton paper; tinted

Fig 1a

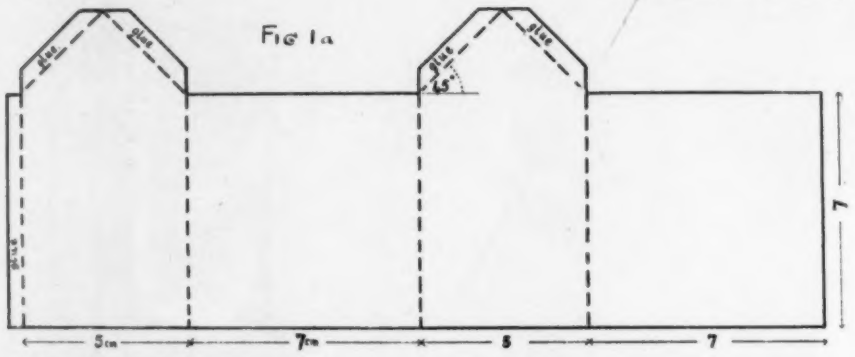
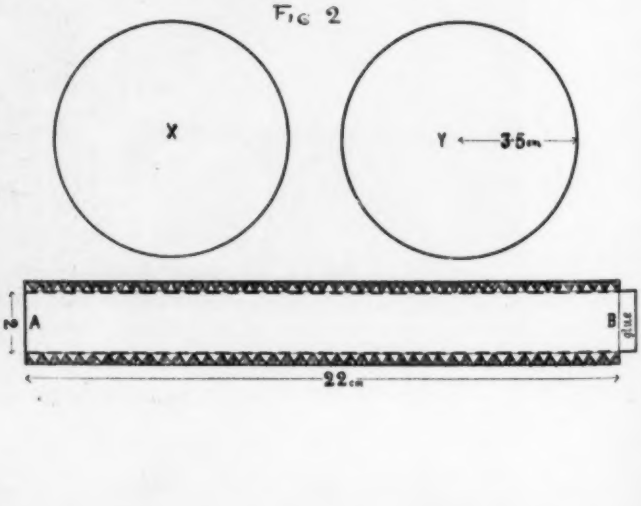


Fig 2

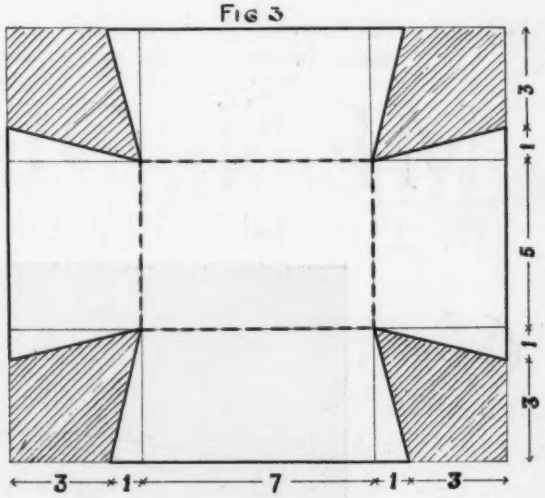
FIG. 2.



card might also have been used. The drawing is at once seen to be similar to that required for the construction of the cube, except that in the present case the part constituting the lid must be made a little larger, to allow it to shut down over the box. The lid may be made separately, instead of being hinged as in the illustration.

FIG. 3.

FIG 3



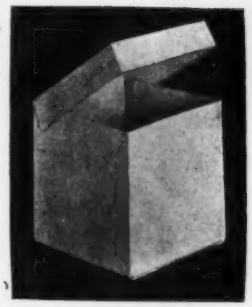


FIG. 4.

FIG 4

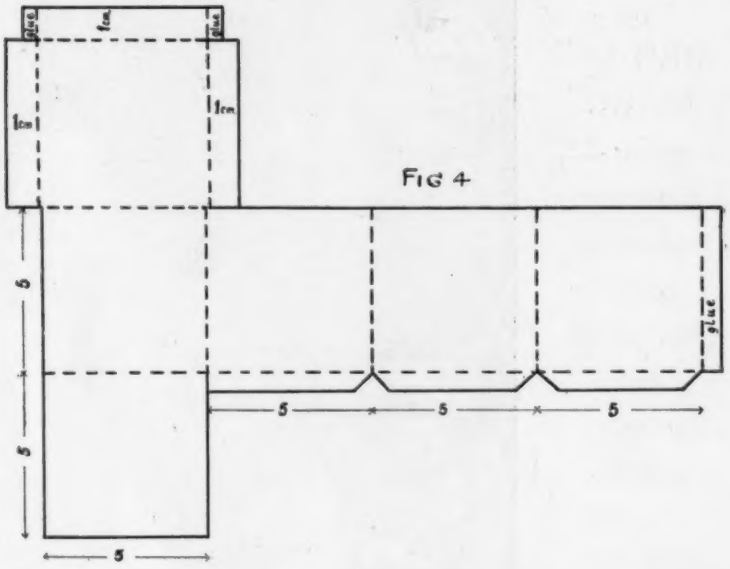
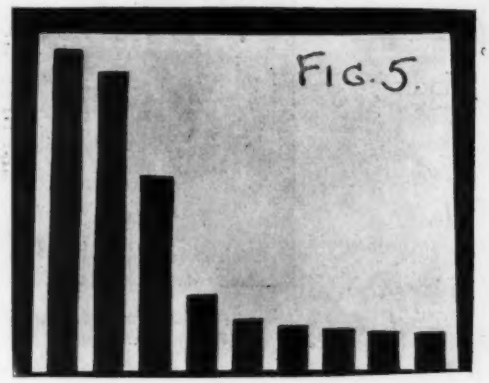


Fig. 5 is a graphic illustration of the comparative amounts of wheat produced by the chief wheat-growing countries of the world in 1909, taken from Mr. Wethey's "Geography Notes" in the May issue of the *Practical Teacher*. It consists merely of a piece of card, on which strips of binding paper of requisite length have been pasted. The calculation of the lengths required will form an interesting exercise for a previous arithmetic lesson. In the case of young children, of course, only rude approximations are possible.

It will be seen that this exercise embodies the principle of a bit of constructive work that can also be made to accompany a lesson involving any group of statistics or table of comparative figures—for example, a domestic economy lesson on the chemical constituents of wheat; a lesson in commercial geography, dealing with amounts of any commodity produced, exported, or imported; or a study of comparative areas of countries, etc.



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An Answer to Inquirers.

IT was our intention to close our offer of Technical Scholarships at the present time, but we are receiving so many new applications for particulars of our scheme and for enrolment that we have made arrangements with the International Correspondence Schools whereby

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2. Send to the Editor a letter intimating that the writer desires to become a Scholarship holder, and giving full name, school address, home address, and status (head or assistant).
3. Send with this letter the coupon cut from the bottom left-hand corner of the fourth page of the cover of "The Practical Teacher."

N.B.—Before a Scholarship can be taken up, a year's subscription to "The Practical Teacher" must be paid, either direct to the Head Office, when the price will be eight shillings, or through a bookseller, who will probably charge six shillings. Receipt must be forwarded to the Editor of this magazine for registration when payment is made through a local bookseller or newsagent.

Our Readers are asked to note
further that our offer now

Applies only to the British Isles.

We are sorry to shut out teachers in other parts of the Empire, but this is now necessitated by our arrangements with the International Correspondence Schools.

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Experiments in Dramatic History.

BY FRED. E. MELTON, SHENLEY, BUCKS.

(*Continued from page 161.*)

THE COMING OF THE ROMANS.

Summary.

THE Britons, acting upon the orders of their priests, who were called Druids, took Commius prisoner; but Cæsar, following his messenger, defeated the undisciplined British warriors, who, to make peace, set Commius free. Yet the first year in Britain was by no means a successful one for the Roman army.

The following year, however, after many battles and skirmishes in the dense forests and marshy lands which covered the country, Cæsar managed to force offers of peace from Cassallon, the head king of the tribes north of the Thames. Then for nearly one hundred years Britain remained untroubled by the Romans.

In the year 43 A.D. the Emperor Claudius determined that the country should be thoroughly conquered, and sent Aulus Plautius with a strong army to carry out his wishes. Later he went himself, and further successes followed.

But constantly the Britons resisted, and for many years a chief named Caractacus held out against the full power of Rome.

With Nero as emperor, Suetonius Paulinus was sent to Britain, and, knowing that the Druids were the prime movers in all the revolts, he made up his mind to attack their stronghold in the Isle of Anglesea.

But meanwhile an incident in Norfolk once more aroused the anger of the Britons. Prasutagus, the king of the tribe of the Iceni, had for many years been a faithful friend of the Romans, and at his death he left his kingdom equally divided between the Roman emperor and his own daughters. The Roman procurator claimed the whole of the land, and when the widow of Prasutagus, Boadicea by name, complained of this treatment she was beaten with rods like a slave, and her daughters were ill-treated by the orders of the selfish Cato Decianus.

Hearing of these acts the Iceni flew to arms, and, joined by the Trinobantes and other tribes, an attack on Camulodunum was made, and all the people there put to death. They also were victorious against the Roman officer Cerealis and the ninth legion. However, Suetonius, returning victorious with ten thousand soldiers, defeated the Iceni and their allies. Before the battle Boadicea spoke to the warriors of her army, but even her inspiring words could not give the necessary courage to her people to withstand the Roman soldiers. A great slaughter of the Britons followed, and Boadicea, rather than fall into the hands of her enemies, ended her life by taking poison.

Play II.—The Revolt of Boadicea.

Characters.

CATO DECIANUS, the Roman procurator; BOADICEA, queen of the Iceni; SUETONIUS PAULINUS, the Roman general; MARCUS, a centurion; A DRUID, a captive of Suetonius; A ROMAN MESSENGER; Roman Soldiers, Tribunes, British Warriors.

Scene I.—The Roman Procurator's Court.

[*Cato Decianus seated, surrounded by Roman soldiers; tribunes standing on one side with rods in hand; enter Boadicea, followed by a few British warriors with spears reversed, to show they come in peace; Decianus rises and walks towards Boadicea.*

Boadicea. You have sent messages to me. What is it that you desire of me?

Cato Decianus. Lady, now that your husband is dead we do not think it fitting that his rule should be placed in the hands of a woman. [*Walks to his seat and sits facing Boadicea, who stands before him with her warriors at her back.*] Prasutagus deemed half his land a good gift to his Roman allies, but we think it wiser that we should rule over the whole.

Boadicea. [*Stepping forward*] What of my daughters and myself? Was not my husband always a friend to the Romans? Have we not worked for you and fought for you in the years gone by? Why do you seek to rob us of that which is left to us? Is this your reward for friendship?

Cato. You may rule, but on the condition that you name us as your masters.

Boadicea. [*Turning half round towards her warriors*] We of the Iceni are proud, and do not brook conditions. Had my husband lived you had not dared to offer such an insult to me.

Cato. [*Rising and looking towards the Roman soldiers*] Can a slave be insulted?

Boadicea. [*Angrily*] Slave? Such a term to me, a queen? False friend, you shall be sorry you spoke such words.

Cato. You shall be more than sorry to listen to others. [*Turning and waving his arm to the tribunes.*] Tribunes! away with her and whip her with your rods until she understands the power of the Roman.

[*The tribunes walk forward and take Boadicea roughly by the arms; the British warriors raise their spears as if to rescue their queen, but the Roman soldiers stand between with drawn weapons.*

Boadicea. Whip me, and such a stream of blood shall flow as shall suffice to wash away the insults of a cowardly Roman.

[*The soldiers drag her away.*

Scene II.—The Roman Camp on Watling Street.

[*Time: the return of Suetonius from Mona. Suetonius and Marcus, a centurion, standing talking together.*

Suetonius. With the stamping out of the Druids in Mona Britain should now have peace.

Marcus. These priests have withstood the Roman power ever since the great Julius first set foot upon the island.

Suetonius. Yes, Marcus, it is true; but what Cæsar failed to do, at last Nero [*bowing at the name*], through his faithful general, Suetonius, has accomplished.

Marcus. They have indeed been at the root of all the disaffection, and it is a great deed to have conquered them.

Enter Roman soldiers marching with a group of chained Druids in their midst. SUETONIUS *and* MARCUS *turn to watch them.*

Suetonius. [*Pointing to the soldiers*] These men have seen stranger sights in this campaign than ever before. Almost I can see now the leaping flames in which you ignorant fiends [*nodding towards the Druids*] intended to burn their captives.

Marcus. Had any of the soldiers fallen into those cruel hands, their deaths would have been terrible.

Suetonius. The Roman heart knows no fear, but had the men held back in the attack I had almost forgiven them, Marcus, so horrible were the cries and shrieks as we advanced.

Enter more soldiers, dragging a Druid who is struggling with them.

Marcus. Mark you priest. Even now he is not tamed.

[*They walk towards the soldiers, who hold the priest as the officers advance. Druid faces Suetonius, and strives to break away from the soldiers' hands.*

Druid. The curses of the true gods fall on you! May your flesh wither and your bodies be given to the flames! How I hate you, proud Romans, and all your race! [*Again struggles.*] But loose me and I will tear out your greedy hearts.

Suetonius. Be silent, fool, or I will have you whipped.

Druid. Our lord the sun scorch——

Suetonius. [*Stepping forward, raising his hand, and interrupting*] Silence, I say!

Enter MESSENGER *hurriedly and falling on his knees before* SUETONIUS.

Messenger. My lord, my lord, the Britons have risen again in the south. The Iceni and other tribes are marching in the direction of Londinium. Camulodunum lies in ashes, for they are burning and slaying as they go.

Suetonius. This is indeed bad news [*turning to Marcus*]. I thought that the selfish Cato had blundered [*again turning to Messenger*]. The Iceni, you say?

Messenger. Yes, lord! The queen, Boadicea, has taken advantage of your absence. Knowing the army had moved north she and her allies are plundering the towns in the south. Londinium is in great danger.

Suetonius. Enough; you may go! [*Messenger rises and goes out to join soldiers. Suetonius turns to Marcus.*] Londinium must suffer—I cannot save it; but this time I will crush these rebels with no weak hand. See that the army is ready to march at once.

[*Centurion bows and passes out. The Druid has been listening, and now again tries to break away.*

Druid. The gods have answered my prayers. May all of your race be slaughtered and burnt! May you be——

Suetonius. [*Interrupting*] Take him away, men, and silence his foul tongue.

[*The soldiers drag the Druid away, still shouting and struggling. Suetonius stands still for some moments and then follows.*

SCENE III. (*a*).—BEFORE THE BATTLE WITH SUETONIUS. BOADICEA'S CAMP.

[*Boadicea stands in her chariot surrounded by her warriors.*

Boadicea. People of the Iceni! Boadicea, your queen, asks a hearing! Foully shamed by those who were my husband's friends, whipped like a dog before the eyes of common soldiers at the order of one who wished to steal our land, I have repaid them for their insults by blood. Victory has been ours, and shall be again. With the memory of Camulodunum and Londinium still fresh, shall we shrink from a meeting with the Roman army? Shall these tyrants take from us our homes, our families, and our freedom? To arms, my warriors, for Roman blood shall flow. Woman as I am, I will lead you, and with you win life—or death.

[*The warriors shout as she ends, and wave their weapons.*

SCENE III. (*b*).—AFTER THE BATTLE.

[*The Britons scattered and slain; bodies lying in heaps on the ground; Boadicea stands alone looking round.*

Boadicea. All is lost!—my country, my warriors, and my honour. If I fall into the hands of the Romans what a fate will be mine! There is but one road to travel, and that I do not fear to take. I have done my best and failed, and I must pay the cost. [*She takes poison and falls among the slain.*

Blackboard Sketch.

The conquest of Britain takes many years:—

1. B.C. 64, Caswallon (or Cassivelaunus) makes peace with Cæsar.
2. Peace for nearly one hundred years.
3. A.D. 50, Claudius subdues Caradoc (or Caractacus).
4. A.D. 61, Suetonius defeats (*a*) the Druids at Mona; (*b*) the Iceni, after revolt.

THE COMING OF THE SAXONS.

SUMMARY.

After nearly five hundred years (55 B.C. to 410 A.D.) as masters of the greater part of the land, the Romans were recalled to Rome to defend their own land from the invasions of barbarians from the east and north. These Goths and Huns gradually drove the Romans back, until each Roman subject was needed for the preservation of the imperial city.

It was the Roman custom to form legions from amongst the men of the lands they conquered, and then, when they were efficient, to send them on foreign service. Thus British legions might be sent to fight in the Roman cause in Germany or Egypt, or any land which might show signs of disturbance.

So Britain was once again left to its own resources, with a civilisation gained, but a fighting spirit lost. The Romans had made roads from town to town, had built walls across the country to keep back invaders from Scotland, had safeguarded the interests of their British subjects, but had sapped their manhood until the Britons were almost incapable of self-defence.

Houses of brick and stone, towns well walled in, luxuries of life, the arts of weaving, pottery, and working in metals had been introduced, but the art of war had been gradually taken away.

With the withdrawal of the Roman garrisons came the renewed attacks of the Picts and Scots from the borders to the north, and fresh forays by tribes of pirates from over the seas to the east. These pirates were Jutes, who came from what is now North Denmark, Angles from South Denmark, Saxons from North-west Germany, and Frisians from South-west Germany and the coasts of Holland and Belgium.

The Britons sent a petition to the Romans asking for help in their difficulties, but no relief was obtained. Later, in the year 446 A.D., a second message was sent—this time to the Roman general, Ætius—called "the groans of the Britons," so urgent was its appeal. This again brought no deliverance to the unhappy people.

Three years later a British chief of Kent, Vortigern by name, had the idea of playing off one enemy upon another, and offered the Jutish invaders who landed in his territory money and supplies in exchange for their help against the Scottish savages.

Hengist and Horsa came with large numbers of followers, and received the Isle of Thanet. Becoming tired of fighting for others, however, they demanded more land, and their request meeting with refusal they decided to change from servants to masters.

Indignant at this treachery, the Britons fought manfully to withstand the encroachments of the Jutes, and at the battle of Aylesford Horsa was killed. Peace followed for some time, but the Jutes returned, and after the battle of Crayford the whole of Kent was ceded to the victorious Hengist in the year 473 A.D. Gradually others came, and as the years passed by the Britons were driven to the north and west, and Anglo-Saxon kingdoms were founded throughout the land. The names still survive in Sussex (the South Saxons), Essex (the East Saxons), and Wessex (the West Saxons). Norfolk and Suffolk are other examples.

Play III.

CHARACTERS.

VORTIGERN, the British chief of Kent; BERIC, a British officer; HENGIST and HORSA, Jutish chiefs; British Soldiers, Courtiers, and Ladies; Jutish Warriors.

TIME, 449 A.D.

SCENE I.—THE COURT OF VORTIGERN.

[*Soldiers in Roman costume are standing about the hall; Vortigern seated in the middle in an attitude of thought; groups of courtiers and ladies scattered about are watching Vortigern curiously and whispering together. All appear anxious. Beric enters and stands bowing before Vortigern, who looks up as the officer enters. The rest of the court begin to gather round as if to hear the news.*

Vortigern. Still that grave look, Beric. Have you any fresh news?

Beric. None that is fresh, my lord, for the barbarians still draw closer each day, and soon we shall be fighting for our lives.

Vortigern. Always disaster; wall by wall, fortress by fortress, they gain from us. These painted men cannot be stayed.

Beric. It was a bad day for Britain when the Emperor Honorius ordered the Romans to leave the land, for alone we are not able to withstand the attacks of the Picts and Scots. Some help must be obtained. The walls are broken down, and daily messages are coming telling of the destruction which these savages have caused.

[*Vortigern rises and stands as if thinking deeply. A courtier turns and speaks to a friend.*

Courtier. Of what use are Roman walls and forts when there are none to defend them. [*Vortigern, hearing the voice, turns his head to listen.*] All the year round the Picts and Scots slay and burn; each spring brings fresh bodies of pirates to our coasts. The Romans did not care for us, or we should never have been left in this unhappy state.

Vortigern. [*Turning fiercely on the courtier*] Shame upon you! The Romans have been good friends to us, but they have now to defend their own land. [*Pointing to the courtiers round and waving his hand.*] Our forefathers would not have needed help to beat back the invaders, but ye have become lovers of luxury rather than war. Soft ye have become, singers of love songs, feasters, drunkards. Away with you, for the time calls for men, and ye have forgotten your manhood.

[*The courtiers scatter and go out whispering together, occasionally looking back as they go. Beric stands watching them until all are gone, and then turns to Vortigern.*

Beric. 'Tis true, my lord, many of us are men no longer; for year by year the Romans have sucked our best blood into their armies abroad, and though they protected us, they have left us without the power or skill to fight for ourselves.

Vortigern. [*Impatiently*] Yes; but a man of the poorest spirit would fight for his own home, and though he lacked skill, despair would make him an enemy to be feared. Rome cannot help us now.

Beric. Our pleadings for help have remained unanswered; and if three years ago it was true that the barbarians drove us to the sea and the sea drove us back to the barbarians, it is still more true to-day.

Vortigern. [*Seating himself dejectedly*] There is still the same choice of two kinds of death—slaughter or drowning. The struggle is hopeless unless we can get help.

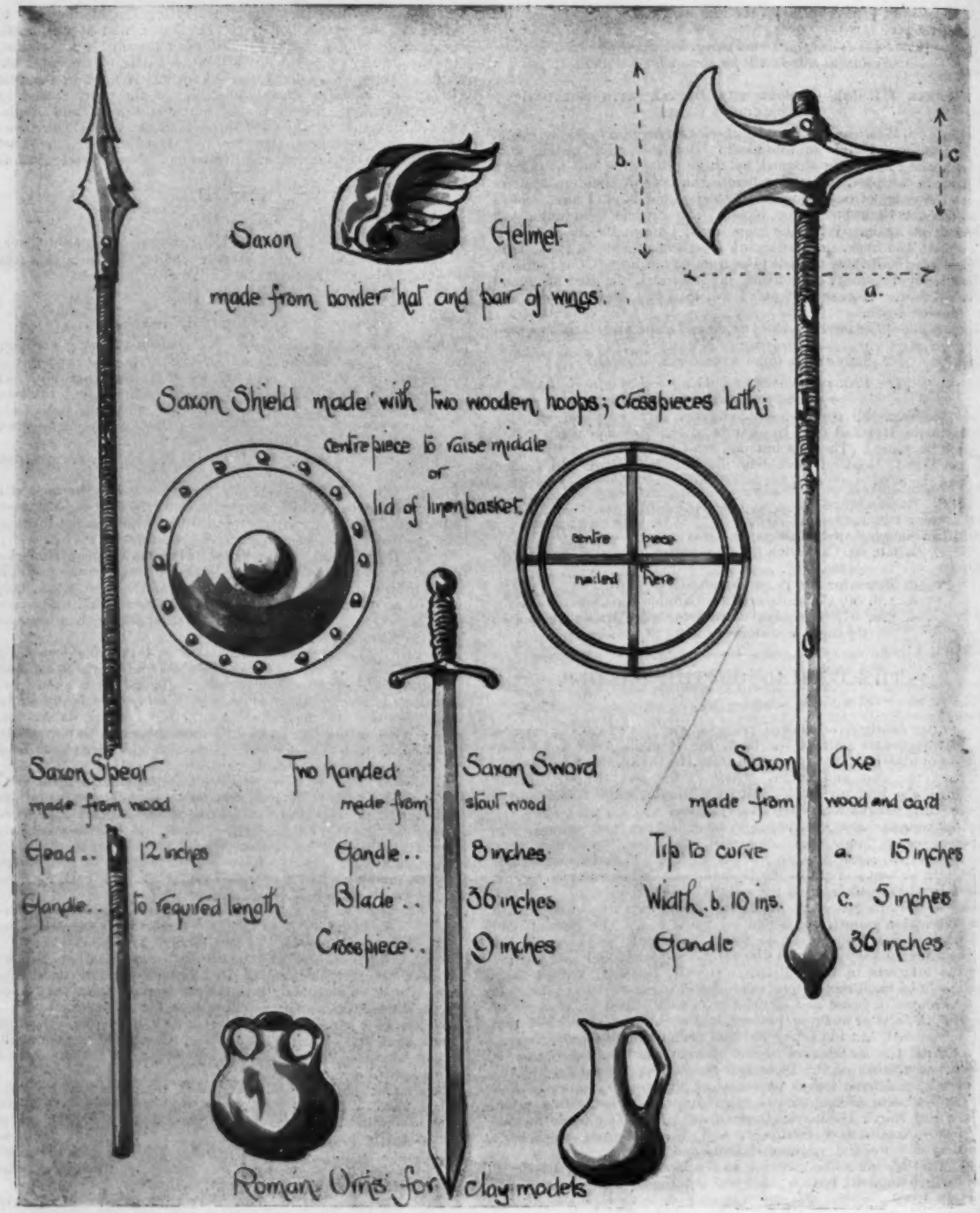
Beric. [*Stepping towards Vortigern*] From whence is the help to come?

Vortigern. I can think of but one way out of our difficulties.

Beric. [*Eagerly*] And that way, my lord?

Vortigern. Buy the services of these Saxon thieves—they would fight for any one for the sake of gain—and with their help drive away the Scottish savages.

Beric. [*Walking slowly to and fro*] It is a good plan, for at least the Romans made our land smiling and rich, so that we have money and presents sufficient to pay for their services. How shall the message be sent to them, my lord? [*Turning to Vortigern.*]



Vortigern. [*Rising and walking toward Beric, and placing his hand on his officer's shoulder*] Be not overhasty, Beric, for I fear that once the Saxons come they will not be anxious to go, and the servants may turn upon us and become our masters.

Beric. Time alone will show that, my lord, and the need of help is urgent.

Vortigern. [*Turning away mournfully*] My country, my country! what is best for you?

Enter a COURTIER *hastily. He hurries to* VORTIGERN. *Others enter slowly to hear what has happened.*

Courtier. My lord! my lord! news has come that a fresh band of pirates has landed on our shores.

[*The other courtiers shrink back and huddle together as if afraid.*

Vortigern. [*Looking towards them with contempt*] So soon? [*Turning to Beric*] Fate drives us, Beric; it is our opportunity, and we must not miss it. Send messages of peace to these thieves, and say that we would discuss terms with them.

[*Beric bows and goes out. Vortigern follows thoughtfully, and the groups of courtiers disperse.*

SCENE II.—THE CAMP OF HENGIST AND HORSA.

[*Groups of Jutish warriors standing, sitting, or lying about, armed with long swords, spears, heavy axes, and round shields. Here and there soldiers move about carrying bundles of weapons; others are quarrelling over the division of articles of booty. Hengist and Horsa stand, resting on their weapons, watching the movements of their men.*

Hengist. [*Turning suddenly to Horsa*] What mean these offers of peace?

Horsa. I cannot say, unless these Britons are cowards, who would rather give to us what we should have to fight to take.

Hengist. [*Laughing*] Dost remember the messenger with his "My lord would have speech with thee"? He shook in his pretty clothes as he spoke, and his teeth chattered as if 'twere a cold night.

Horsa. [*Laughing and mimicking the voice*] "My lord would have speech with thee;" and having said his say he went, trembling, as if he had just escaped death.

Hengist. [*Putting his hand on Horsa's shoulder*] Peace, Horsa! Here comes "my lord," with our trembling friend behind him.

[*Enter* VORTIGERN, *followed by* BERIC, *several courtiers, and a body of soldiers. They put down their weapons to show they come in peace.* HENGIST *and* HORSA *give up their weapons to one of their men, and walk forward to meet the Britons. The Jutish warriors gradually gather round in a circle about the Britons.*

Hengist. [*Holding out his hands to Vortigern*] I give you welcome, my lord.

Vortigern. [*Grasping the hands of Hengist*] I come in peace [*turns to Horsa and grasps his hands*] and to seek your aid.

Horsa. Your messenger yonder [*nodding in the direction of the courtier who had carried the message*] spoke your words of peace with all gentleness.

[*The courtier bows, trembling, to Horsa.*

Hengist. [*Laughing*] Yes, by Thor, like a true Briton. In what way can we aid you, my lord?

Vortigern. The Picts and Scots ravage our lands and plunder our towns until we can no longer resist them. Without help we have no safety from attack, and to you, as brave men and warriors, I come, to ask your services.

Horsa. You wish us to fight for you and risk our lives in your cause?

Hengist. [*Turning to Horsa*] What matters it in whose cause we shed our blood so that we are paid for it. We are men who play with death each day, knowing that in the gods' good time we win Valhalla.

[*The warriors gathered round beat on their shields with their weapons in applause.*

Horsa. It is true; but war is our trade, and we must be paid for our service.

Vortigern. [*Aside to Beric*] These are men indeed.

Beric. [*Addressing Hengist*] Payment will be made. Money and supplies sufficient for your needs can be found if you will but free us from the barbarians.

Vortigern. [*Turning to Horsa*] We would buy your services, and it is for you to make conditions.

Horsa. Our land is barren, your land is good; our land is poor, your land is rich. Give us land and money, and we will be your warriors and help you.

Vortigern. Land and money shall be found for you.

Hengist. [*Turning to the warriors*] Is it agreed? [*The warriors shout in chorus*] Agreed.

[*Again they beat upon their shields.*

Hengist. 'Tis well [*turning to Vortigern*]. Henceforward we are your men, obeying your orders.

[*Hengist and Horsa hold out their hands to Vortigern, who grasps them in turn.*

Vortigern. I go in peace.

[*Turns with his followers and passes out. The Jutish warriors return to their former occupations. Hengist and Horsa stand watching them go, and then turn to one another.*

Hengist. It is a good bargain, Horsa.

Horsa. Yes; and in a short time, by all the gods, it shall be better.

Hengist. What is your meaning?

Horsa. [*Laughing*] Your brains grow muddy, Hengist. By then there will be so many of us that we shall find land and money for ourselves.

[*They pass out laughing together in the direction of the camp.*

Blackboard Sketch.

1. The Romans taught the Britons—(*a*) To make roads; (*b*) to build houses and temples; (*c*) to work minerals and grow crops; (*d*) indirectly the truths of Christianity.

2. The Romans took from the Britons—(*a*) Their best soldiers and men; (*b*) their power to protect themselves.

3. When the Romans went away the Britons were open to attack from—(*a*) The Picts and Scots by land; (*b*) the Angles, Saxons, and Jutes overseas.

DIRECTIONS TO TEACHERS.

The period covered by the plays provides many models suitable for working in clay and wood. A very useful and simple object is a Druid temple, which can be easily made in the handwork lesson. The side of a box serves as a base, and on to it are nailed pieces of "stripwood," arranged in a circle, to represent the vertical stones, and upon these uprights other pieces of unequal lengths are nailed to represent the horizontal stones. When finished this makes an effective model, which can again be reproduced in clay. Specimens of Roman pottery and coins can be modelled also, whilst most instructive exercises are the modelling in clay of the Roman walls, camps, and roads built throughout the country. With such exercises the children fully appreciate the idea of the chains of forts, the camps, and the roads standing above the surrounding country, with the facilities of defence for the Romans and the difficulties of attack for the Britons. The Saxon weapons are very simply made from quite handy materials—the spear being made upon the lines of the British spear, but the head more carefully fashioned; and the sword after the manner of the Roman sword, except that the piece of wood chosen must be stouter and of greater length. The shield can be made from two ordinary wooden hoops, such as the children play with. Strips of lath are nailed across, and the whole covered with some stiff material which will take gilt paint. The raised middle can be provided by the lid of an old linen basket. The helmets are quickly made by removing the rims of bowler hats and stitching wings upon the sides. The blade of the axe makes a very good cardboard and wood exercise. Two pieces of card are cut to the required shape and then placed upon a piece of wood similarly shaped, but tapering from the handle to both the cutting edge and the rear point. The blade is then placed upon a stout ash handle, and when finished makes a very serviceable weapon.

"THE CHILD."

A MONTHLY JOURNAL DEVOTED TO CHILD WELFARE.

The Child, a new monthly journal devoted to child welfare, will appear in the early autumn. Dr. T. N. Kelynack has undertaken the editorial oversight, and will be assisted by a thoroughly representative staff of medical, educational, and philanthropic experts.

The journal will be suited to the requirements of all engaged in Child Study or working for the betterment of child life. The first number contains communications from the Bishop of Ripon; the Earl of Meath; the Right Hon. John Burns, M.P.; Sir Lauder Brunton, Bart., M.D.; Sir Edward Brabrook, C.B., V.P.S.A.; Professor J. S. Mackenzie, Litt.D.; Sir George Kekewich, K.C.B.; Professor Patrick Geddes; Professor H. Griesbach; Dr. A. Mathieu; Professor J. A. Green, M.A.; Professor Schuyten; Mrs. Kanthack de Voss; Dr. Theo. Hyslop; Sir James Yoxall, M.A., M.P.; Miss Temple Orme, LL.D.; Rev. W. T. A. Barber, M.A., D.D.; J. Lewis Paton, M.A.; John Badley, M.A.; Rev. Arthur E. Gregory, D.D.; Dr. H. T. Ashby; Lee F. Hanmer; Montague Crackanthorpe, K.C.; Dr. Bertram Thornton; and others. Such a list affords ample evidence of the authoritative character of this forthcoming journal. Leaders in all branches of Child Study in this and other lands are among the promised contributors.

The Child provides a much-needed medium for co-ordination and co-operation. Parents, educationists, philanthropic workers, as well as physicians, school doctors, and other students of child life, will find that all their special requirements are adequately met by it.

In order that *The Child* may serve all interests working for child betterment, the publishers are arranging to issue with each number a *Directory* of schools and other educational establishments; also of societies dealing with all forms of child welfare, and of hospitals, orphanages, and like institutions for children. Heads of schools and secretaries of hospitals for children and similar public institutions should communicate at once with the publishers. *The Child* is clearly a publication which no friend of the children can afford to neglect. The publishers are Messrs. John Bale, Sons, and Danielsson, Ltd., 83–91 Great Titchfield Street, Oxford Street, London, W.

The Supply of Teachers.

BY ALLEN CROFT.

ALTHOUGH Mr. Walter Runciman may still adhere to his statement in the House of Commons that he is not aware that college-trained teachers "are experiencing unusual difficulties in obtaining appointments," it is quite evident that sooner or later the President of the Board of Education will be forced from his pedestal of ignorance, and compelled to acknowledge openly that the N.U.T. has been right, and his official advisers wrong, concerning the extent to which unemployment prevails. So far as I am aware, neither the Local Education Authorities nor the Board of Education have ever made the slightest attempt to deal with the "Supply of Teachers" on sound and scientific lines. It surely should not surpass the wit of the brilliant satellites of Sir Robert L. Morant, K.C.B., to estimate, with a fair amount of accuracy, how many young people ought yearly to be admitted as bursars or pupil teachers, in order to supply the inevitable wastage caused by death, superannuation of the aged and broken down, removal from the profession either by marriage or other cause; and a margin might even be allowed to provide for improvement in the teaching staffs, whenever a Minister of Education arises with the courage necessary to promulgate such an edict as "Circular 709." I have not forgotten one iota of the egregious prophecy of "E. K. C." some three or four years ago; but since this promised a deficiency of about ten thousand certificated teachers in this year of grace, it can hardly be brought within the category of a fairly "accurate" estimate. The number of teachers required having been definitely ascertained, then, by arrangement with the various Local Education Authorities, which should be encouraged to undertake to furnish young teachers according to their school population, this number of entrants to the profession—*and no more*—should be recognised by the Board of Education.

The present policy of

EARMARKING SCHOLARSHIPS FOR INTENDING TEACHERS

is hopelessly wrong, educationally—not to say vicious. Scholarships ought to be at the disposal of those children likely to make the best use of them; and if such children desire to become teachers, so much the better for the schools. But to allot a scholarship to a child of moderate capacity solely because he professes his willingness to become a teacher, whilst a much brighter and more capable child goes "empty away," is an iniquitous proceeding, only to be justified by the callous authority in search of cheap labour. All those attractive brochures entitled "How to become a Teacher" are so misleading as to deserve the description

"TRAPS TO CATCH THE UNWARY."

Usually they pretend to show that to the successful boy £300 per annum is obtainable as a headmaster, whilst they do *not* state that *less than two per cent.* of headmasters receive £300 per annum; and that for the vast majority of boys the prospect of becoming a headmaster *at all* is so remote as to be almost negligible. The display of posters in the schools, advertisements in the provincial press—I had almost written "lying" advertisements—the touting of interested parties have all had their effect during the past four or five years, until to-day the position in the teaching market is perilous, and the number of college-trained teachers without employment absolutely unprecedented. Young men and women on the threshold of life, as qualified teachers, are driven to "demonstrate" by mass meeting, at the Memorial Hall, in order to attract public attention to their calamitous plight; and I rejoice at the amount of consideration and sympathy evinced by the leading newspapers.

Lying before me as I pen these words is a four-paged leaflet, entitled

"THE SCANDAL OF UNEMPLOYED COLLEGE-TRAINED TEACHERS,"

in which are disclosed certain facts that will probably make the President of the Board of Education himself begin to modify the hard-mouthed attitude he has hitherto adopted. It has been issued broadcast by the Organisation Committee of the Unemployed Teachers—a body of college-trained, certificated teachers, whom desperation has rendered enthusiastic, and who declare that they "will not rest content until they have secured justice for their most unfortunate comrades." It hardly needs stating here that they will have whatever assistance is possible from the Executive of the National Union of Teachers, who have been painfully aware of the misery and sufferings of some hundreds of unemployed teachers during the past two years. The "unemployed" agitation originated from the circumstance that out of the 950 students leaving the London County Council training colleges this summer only ninety-five have been appointed to the L.C.C. provided schools; but naturally the movement has developed and spread all over the land, until the Organisation Committee are in touch with colleges as far apart as the Armstrong College, Newcastle-on-Tyne, in the north, and Hartley College, Southampton, in the south. I believe that arrangements are already in hand for the holding of another mass meeting in November, whilst it is possible that the forum of the metropolis, Trafalgar Square, may be utilised for a purpose unique in the annals of the teaching profession.

The unemployed teachers are convinced that their cause is a national one, and they claim that their deplorable condition is "a menace to the best interests of education generally.....bad not only for the teachers, but also for the parents and the parents' children." Mr. Walter Runciman *may* hug himself with the delusion that the salaries received by certificated teachers are no concern of his nor of the Board of Education. He *may* make light of the circumstance that college-trained (and other) certificated teachers (because they are human *and must live*) have been compelled to accept the remuneration of uncertificated and even supplementary teachers; but a Nemesis surely awaits him if he remains supreme at Whitehall, and the rudest of awakenings is in store for his *entourage* of Laodiceans. For a quarter of a century some of us from Union platforms have urged that the parents of the children in the nation's schools have a right to demand that the services of the best men and women in the country, those of the greatest ability, broadest sympathy, highest culture, and personal character and refinement, should be available for

their children's education. But the *laissez-faire* attitude of the President of the Board of Education means only the setting back of the clock; and the improvement in the quality of the teaching raw material will inevitably be arrested for half a generation.

Since my last reference to this topic in the *Practical Teacher* a deputation of six students—men and women—representing the various metropolitan colleges has waited on the L.C.C. Education Committee, and its spokesman, Mr. Arthur Burrows (secretary Press Committee) stated their case with great force and lucidity. I was impressed by the way he pointed out how they had been lured into the teaching profession,

"BRIBED BY BURSARIES, SCHOLARSHIPS, AND PRESS ADVERTISEMENTS;"

and he went on to add that if they were not actually promised, they were at all events "insidiously led to expect employment at the end of their training. The L.C.C. could no more repudiate the obligation—the moral obligation—they owed to the students who had been through their own colleges and had been enticed into the profession by a former council, than they could repudiate the financial obligations of a former council." Mr. Burrows is an optimist of the first water if he has any faith in the recognition of "moral" obligations by public bodies; but an outsider may be permitted to ask, What right has the L.C.C. to embark on the training of some thousand teachers annually, when apparently it has need for the services of only 10 per cent. of them? The cost of training a public elementary school teacher is approximately some £300, borne by the taxpayer, ratepayer, and parent; but a more iniquitous waste of public money cannot be devised than that lavished on the production of certificated teachers, for whom no remunerative employment is forthcoming.

Sir John Gorst, in addition to presiding over the mass meeting at the Memorial Hall, has written to the *Times* summarising the views of the unemployed teachers with all his well-known ability. Probably I was not the only man who, after perusing his letter, was tempted to inquire what Sir John Gorst himself did during his fairly lengthy stay at the Board of Education in the direction of ridding the schools of the unqualified practitioner. Unless my memory is playing me a scurvy trick, a microscopical investigation would reveal no results worth recording on this page. Sir John was probably a little nettled at Mr. Runciman's refusal to receive the deputation of students if accompanied by their chairman; and, on the whole, I think the students did right to decline "the quiet informal talk and frank discussion" held within closed doors. A long experience at Russell Square makes me more than doubtful of the value of all private deputations to those in authority at Whitehall.

Meanwhile it is evident that the Executive of the N.U.T. must pursue their policy of warning parents of the risks of unemployment in the teaching profession; and probably an elaborate and argued memorandum on the whole subject of the "Supply" will be published from Bolton House within the next few days. And again I call on Mr. Runciman TO ACT immediately, and—

1. Forbid the recognition of any *new* supplementary teachers.
2. Close all the side entrances and back doors for uncertificated teachers.
3. Give notice of the early abolition of the Acting Teachers' Examination.

REVIEWS.

Town Study. By M. M. Penstone. (*National Society.*)

The authoress here gives us "Suggestions for a Course of Lessons Preliminary to the Study of Civics," and we have found her chapters very stimulating indeed. The method of using local knowledge here indicated is excellent, and ought to be adopted by every teacher in town and country when dealing with the geography and history of his own immediate district. The volume, which is fairly exhaustive and complete, is well produced, and adequately, though not very fully, illustrated.

Simple Jewellery. By R. L. L. B. Rathbone. (*Constable and Co., Ltd.*)

This handsome and well-illustrated volume is described as "a practical handbook dealing with certain elementary methods of design and construction, written for the use of craftsmen, designers, students, and teachers." The author thus aims at satisfying both the "serious amateur" and the much more serious professional. It is a dangerous plan, which is apt to frighten both classes of possible buyers; but we can assure all who are interested in this subject that they will find the book better than the author's plan with its double aim. In short, it is a volume for the junior trade school, where, we feel quite confident, it will soon be well known.

English Narrative Poems. Selected and Edited by M. W. MacCallum, M.A., LL.D., and E. R. Holme, M.A. (*Blackie and Son, Ltd.*)

This is a highly attractive volume for all lovers of the best literature, containing twenty-five of the longer poems of writers from Spenser to William Morris and W. B. Yeats. The object of the book is "to illustrate in an attractive way special aspects of the genius of certain typical poets and certain successive phases of English literature." The selections are consistently *story* poems, and are evidently to be read chiefly for the story, seeing that there are no notes or other editorial commentary. We think that, in spite of prevailing fashion, there will eventually be a call for notes to the volume.

English Composition. By William Murison, M.A. (*Cambridge Press.*)

This is another and, on the whole, a conscientious and worthy attempt to deal with the thorniest subject of the whole curriculum; for the true teacher knows that all so-called "logical" instruction in "composition" is like a strait waistcoat to those who are endowed with "the gift." However, those who are not so endowed form by far the large majority, and they will find in this attractive volume assistance of a really helpful character. Examination students will be glad to know that the book contains chapters on Paraphrasing and on Modernising Older Prose, as well as on Précis Writing and Prosody. The section on the distinction between poetry and prose would not have been greatly missed had it been omitted. This is too delicate a matter for examination students.

NEXT MONTH.

A special Illustrated Review for our Lady Readers of

HANDICRAFTS IN THE HOME.

By MABEL TUKE PRIESTMAN.

Published by Messrs. Methuen and Co., Ltd.

Back to the Land.

THE EXPERIENCES OF A NOVICE.

Disillusioned!

At no period of my journey back to the land was I other than fully conscious that the calling would be one of incessant toil, yet I was certainly not prepared for the exacting nature of the multitudinous duties which claim one's attention. The days simply fly, each one crowded with activities. My friends altogether fail to realise what hard work a small holding such as this entails, and the long hours necessary to keep things going. The popular idea still seems to be that such an occupation as this means plenty of time for reading, long and enjoyable country walks, and hours spent in a deck chair viewing Nature and drinking deeply of the pure air. The only thing I find time to do is the aforesaid drinking, and this is the secret of our happiness. We shall never be able again to fill our lungs with town-polluted air with satisfaction or content. Those who have paid us a visit in our retreat soon get a more correct view of our enterprise. A walk across the wet meadow in the early morning, with a basket of meal on one arm and a two-gallon can of water on the other, helps to produce the desired effect.

Preparing for the Pig.

Some have thought the pig a long time in coming, but there was considerable difficulty in coming to a decision as to the part of the premises in which he was to be housed. Adjoining the market garden in the field was the first idea, but thoughts of winter and having to carry the "swill" down the lane and across the meadow in snowy weather made one hesitate. Ultimately the local surveyor was consulted as to how near the house the sty could be put up; and to my joy—I hope it will never be anything else—the position once occupied by my predecessor's chicken-fattening shed was approved, provided no neighbour complained and he, the pig, was kept clean. Most of the old fattening shed has been used up in building a fowl-house in the meadow, and only one side now remains.

The position having been fixed, building was at once started. An excellent design of a wooden sty, taken from that admirable paper the *Smallholder*, was adopted with slight alterations. Railway sleepers, which were already on the premises, were used as posts. These were sawn to the correct length, and prepared with mortises to hold the rails to which the sides are fastened. For a cold morning give me a sleeper to saw in two, especially if the said sleeper is damp! Getting these cut, and the numerous mortise holes dug out with a chisel, took nearly a week of my spare time. When, however, the posts were in the ground and the rails fastened round we had the sty in outline.

The bedroom—I mean the pigs' sleeping apartment—is six feet by five feet, and the outside open run eight feet by six feet. The roof is boarded and covered with felt. The whole of the woodwork has been creosoted outside and in, and should last some years. A cart-load of stones and a bag of Portland cement made a good concrete floor.

The most difficult part of all was the laying of the concrete, so as to get the floor to drain out at one corner. Before the pigs arrived a deluge of rain—a not unusual occurrence in these days—proved that our aim had been obtained, for no water was left in the sty. The whole sty is thoroughly substantial, and has occasioned many comments of approval. An improvement was made to the *Smallholder* design by adding a feeding door to open over the trough.

The Pigs arrive.

When the sty was finished, not forgetting a substantial feeding trough, and the inside compartment well littered with straw, I went to view a family of pigs, and selected what I thought were two promising youngsters. The breed is probably a Berkshire cross, and the animals are what are kept locally. I discussed their points with the owner with all the air of a full-fledged farmer; at the same time I am quite conscious that I *may* have given myself away.

Later in the day the pigs arrived in a sack,* and are much admired by the family. I am now studying the problem of how to raise pork quickly, cheaply, and in such a way as will please both the butcher and his clients. Boiled potatoes and greens mixed with sharps seems at present to suit them well; and they do not forget when the near approach of feeding time comes to cause a general uproar as a reminder.

Exciting Times in the Apiary.

The driven bees mentioned last month, which will enable me to increase my hives to four, have arrived. Two new hives had been purchased and painted, and were in readiness for the eventful day—eventful, for this time I was to hive the bees myself. These driven bees are obtainable generally in August, and are bees that have been driven out of the old-fashioned straw skeps in order to get the honey within. These skeps have now been very generally superseded by the modern bar-framed hive. The bees arrived in two boxes, measuring about fifteen inches by eight inches, with the top side fitted with perforated zinc. Through this zinc the bees were fed with syrup to enliven them up after their railway journey, and when the shadows began to lengthen they were ready for hiving.

In front of the hive a board is placed level with the entrance, and on this the bees are shaken out of the box. If all goes well, with a little guidance they will follow each other into the hive. The guide-book told me to unscrew the top of the box, and place it with the lid downwards for a few minutes to enable the bees to rise to the inside; then I was to separate the box from the lid and—well, what really happened was that I shook the contents on to the board, pushed a few to the entrance with a feather, and waited for them to march in, as they should have done.

The bees lay on the board, a boiling, living mass quite six inches thick. They boiled over the sides, clustered under the rain-board, got under my protecting veil and stung me twice. My eye-glasses fell off inside the veil, and I retired—no, not ran, but retreated in good order; and after repairing myself and ridding myself of bees I returned to the front and continued the operations—namely, pushing the bees in masses towards the entrance and encouraging them to enter their new home.

* Otherwise a poke.—Ed.

Darkness fell upon the scene, and I made no attempt to deal with the second box that night. I slept on it. The next morning I took a walk in the direction of my neighbour the beekeeper, and after mentioning the weather, casually asked whether he thought it advisable to feed the second lot of bees before hiving, as I had been unable to hive them the night before. I had some hopes that they might be more easily dealt with after a feed, for are we not all more docile after dinner? This he thought was unnecessary. Did he not think I had better hive them in the evening? No; the sooner the better, he thought. So after dinner, and between the showers which had been falling all day, I made my preparations similar to the previous night. This time I left the upturned box quite an hour before I parted it from its lid.

The bees were shaken out as before, but for some reason or other would not enter the hive! They boiled and hummed, and although I pushed them gently towards the entrance, few went any further. A large number were still inside the box, and were with difficulty removed. A good many, I am sorry to say, were dead. Then, to my surprise, I noticed that a mass of them had risen and were clustering on one of my other hives, and I began to despair of ever getting them together, and I was in mortal fear of losing the queen bee.

Feeling rather helpless, I sent off and implored the beekeeper to come in haste to help me out of my trouble. This he did, and together we shook them into the top of the hive. What my friend thought had happened was, that seeing the sunshine after being so long confined in the box the queen bee had taken flight, and settling on the nearest hive was naturally followed by the other bees. All's well that ends well, but I am sorry to have made such a muddle of the whole affair. I have not since made a careful inspection of them, but have contented myself simply with feeding them. In a few days I must open them up and see how many were saved and how they fare.

The Chicken.

The chickens are all growing very fast, and soon will pass into the pullet stage. As they grow up it is increasingly difficult to find room for them. Their houses become too small, and there has to be a constant shifting about. Some of the earliest hatched pullets are already beginning to lay, and others seem to haunt the nest-boxes, wondering to themselves, I suppose, whether they ought to make a start.

The Potatoes.

Last month I had to record the disease in my potato crop—a crop that looked most promising. The haulm blackened and quite died down, so there was no chance of any further growth. After lifting a root or two I decided to harvest the whole crop. At the time of writing this is in full progress, and already two to three tons have been stored. I am glad to be able to say that there is very little disease, and altogether it is a good crop, though the tubers are smaller than they would have been had the progress of growth not been stopped by the disease. As ample submitted to a greengrocer met with his approval, especially after cooking, and an order for a quarter of a ton followed. I shall endeavour to clear them right off as soon as possible, reserving for myself the small unsaleable size, a good many of which will help the pigs towards the butcher's shop.

PRACTICAL NOTES ON SCHOOL GARDENING FOR OCTOBER.

BY BRUCE COOK, F.R.H.S., CHINGFORD.

Flower Culture.

ROSE CUTTINGS should be made towards the end of the month. Select any nice straight shoots of this year's growth that have produced flowers. Take a very sharp knife (a budding knife does splendidly, and cut a little of the old wood away with this shoot. This piece of the old wood is termed "the heel." It is a good plan to shorten the shoot to about six or ten inches in length. Strip off the lower leaves, and also the spines.

A bed of suitable soil should have been prepared some time before. Good light garden soil, mixed with sharp road sand (or ordinary sand) and leaf mould, helps the formation of roots. Trenches of suitable depth should be dug out with the spade some eighteen inches apart. We have always been more successful when we have placed some fine sand an inch in depth along the bottom of the trench. Place the prepared cuttings in the trench so that the "heel" rests firmly on the sand, leaving a foot or so between the cuttings. Then gradually fill up the trench, treading the soil firmly up against the cuttings. Some advocate placing the cuttings in a slanting position. Occasionally look over the bed, and tread the soil firmly round the cuttings. Throughout the whole of the time the cuttings are in the nursery bed great care should be taken to see that they are firmly fixed in the soil. They should be kept in the nursery bed for twelve months. Say the cuttings were made in November; they are not ready for planting out until the November following. Some cuttings of cluster roses that we inserted last November have now got branches seven feet in length. It is a good plan not to allow any cuttings to bloom for the first year; and always write the name of the cutting on a wooden label, and fix it in the soil. Do not prune roses until March or April next. This is a good time, however, to cut back any very long straggling shoots, especially on standards.

Dahlias should be watched. As soon as they are touched by the first frost the leaves turn black and die. Then cut through the main stem about four inches from the ground, and remove the top part you have cut away. Wait, if possible, until a fine dry day, and then lift the roots and store them away in boxes in a cool dry place where the frost cannot reach them. Should there be any named varieties with labels with the names written on, take care to securely tie each label to the four inches of stem. Do this carefully, as it is most annoying when looking over the roots to find that the labels have got mixed up or are loose. Scatter a little fine soil or sand between the tubers.

The herbaceous border should receive attention in October. Cut away any stems of plants that have flowered; collect the stakes, and tie them up in bundles for use next year. Divide any large clumps, and replant in suitable positions.

October is a good month in which to form the herbaceous border, although most hardy flowers divide well in March. Give any pieces of these plants to the lads for planting in their own gardens at home. You are thereby creating a love for gardening in the home. Well I remember one father becoming interested in gardening through a few roots of hardy flowers being taken home by one of his boys. Having caught the fever of gardening, he took a great interest in the hobby, and in time developed into a really successful gardener, and exhibited on more than one occasion in the cottagers' classes in our local show.

Cuttings of violas, pentstemons, calceolarias, etc., should all be made by the first week in October.

If you are fortunate enough to possess a cold frame, insert cuttings of these in prepared soil. Water well, and put on the light, leaving an inch space at the top of the frame.

But if you do not possess a frame, obtain some boxes with sides about an inch in thickness. Remove the top and bottom of the box, and place the framework over some light, sandy soil. Put in your cuttings, and cover the frame with a piece of glass. Or instead of removing the bottom of the box, bore some holes in the same for drainage. Put in some cinders about an inch in depth for drainage, and then a sufficient depth of suitable soil. Put in your cuttings, and place a piece of glass over the box. The latter plan has the great advantage that you can remove the box of cuttings bodily to a place of safety or a cool greenhouse during very heavy frosts.

As a rule, all cuttings should be made from this year's growth. Take a sharp knife and make a clean cut just below a joint or node, and be careful to see that the cutting rests at the bottom of the hole.

Clumps of violas and pansies are often lifted and divided, and those growths containing little rootlets inserted. Nurserymen generally cut down violas and pansies early in September.

Applying Voss's Grease to the Paper Band.

This induces fresh new stems to grow, which are ready for division in October.

Wallflowers may be planted in any well-manured ground. Do not plant them too thickly, as they never flower so freely if they are crowded together.

Growing Bulbs in Water.—Many grow bulbs in water in special vases for the purpose.

Select bulbs of good size for this work, and place a piece of charcoal at the bottom of the vase.

Let the base of the bulb just rest in the water. Then store the glasses and bulbs away in a dark cupboard. Take them out occasionally to see if water is required. You will notice that roots are drawn, as it were, into the water. When plenty of roots are formed take the vases out of the cupboard and expose them to the light in any window-sill. If the bulb has grown in the darkness, it will be seen to be white, but upon exposure to the light it will gradually assume its natural colour.

Bulbs grown in water should not be thrown away after flowering, but should be planted in any suitable corner of the garden; for although they do not produce large blooms the following year, yet they may flower again.

Bulbs, especially hyacinths, do well in water. One advantage is that the children can see the root formation through the glass, and on this account a few should be grown and placed on the school window-sills.

Bulbs should all be planted in the open by the middle of October. Prepare the soil by deep digging, and add plenty of leaf mould, sand (if the soil is heavy), soot, or clays.

See that the bulbs are put in straight rows by means of a line, and plant three or four inches deep. Should the soil be heavy and wet, place half an inch of silver sand for the base of the bulb to rest on.

Cover with fine soil, and on the top of all spread some cocoa-nut fibre to the depth of an inch; this protects any early growths in the spring from frost, and also gives the bed a tidy appearance.

Vegetable Culture.

Late potatoes should be dug up early in the month. Although the quantity grown in a school garden is seldom sufficient to "clamp," still the method of storing potatoes in clamps should be explained to the lads.

Runner beans should be picked before the frost touches them. Should there be a good number left, you might explain to the lads the following easy plan of keeping them fresh. A cottager I knew always prided himself on having fresh runner beans on Christmas Day. Obtain a large jar, and place some crushed salt at the bottom. Let the salt be some two inches in depth. On the salt place a single layer of scarlet runner beans, then some more salt, and so on until the jar is filled. Cork well with a greased cork, or cover the mouth of the jar with some air-proof covering, and store in a cool place. Stand the beans in water for a few hours before cooking, and they are nearly as good as beans you pick in September.

Celery should receive its final earthing up after it has had a good heavy dusting of soot. Do not, as a rule, earth up celery on a wet day.

Some growers keep a few old sacks handy, which they throw over the top of the plants on the approach of severe frosts.

Carrot and beet should not be left too long in the ground when fully grown. They should be dug and stored away in a frost-proof place. Explain to the lads that if they cut off the ends of the beetroot they will "bleed," thereby losing their colour. Before boiling they should be washed, and then boiled, roots intact, and the skin removed after boiling.

Parsnips should be left in the ground until they are required for eating. They keep better and fresher in the soil, and they are unharmed by the frost. In fact, parsnips improve greatly in flavour after they have been exposed to a few frosts.

Leaves should be collected as they fall. A good plan is to dig out a hole in a spare corner and throw any leaves therein, after having mixed a little soot or lime with the leaves. This makes excellent leaf mould.

Fruit Culture.

Grease banding should be performed early in October. Obtain some grease-proof paper about seven inches in width and a foot in length, and paste it round the stem of the tree midway between the surface of the soil and the lowest branch of the tree. Then tie the paper firmly to the tree by means of tape or string. Be careful to see that there is no space between the paper and the bark. Some recommend cart grease to be applied, but from experience we do not find this always a success. We have tried Voss's banding grease with good results. It is sold

Finding Pests caught on the Grease.

in tins, and it keeps moist for years if properly covered up in the tin when not in use. Apply a coating of this grease round the middle of the grease-proof paper, making a band of grease

about two inches wide and a quarter of an inch in depth. The boy in the picture is applying it with a piece of lath. This band of grease acts as a trap for the wingless winter moth, March moth, and mottled umber moth. These female moths, being

AN INTERESTING LESSON ON FRUIT-TREE PESTS.

wingless, crawl up the stem from the ground. As they crawl over the grease band they are caught in the grease. These moths come from the chrysalides in the soil under the trees from October till April. They ascend to lay their eggs in holes in the bark or the branches. As soon as the caterpillars emerge from the eggs they have laid they devour the buds, etc. One of these moths has been known to lay as many as three hundred eggs; hence the importance of destroying the moths as they ascend to lay their eggs. The lads should be taught to occasionally look over the grease bands from October till April. The winter moths and other insects found on them should be examined under the microscope, and lessons on the various pests might be given to the lads.

Ground should be prepared for the planting of fruit trees. These may be successfully planted in some districts as soon as the leaves have fallen. In other districts—especially clayey ones—it is better to prepare the ground during the winter, and plant during suitable weather in March.

Cuttings of gooseberries and currants should be made towards the end of the month.

Root-pruning should be thought out; and those trees not bearing fruit, although producing a vigorous growth of leaves, should be root-pruned. This operation should be carried out in early November, when we hope to describe the operation.

Suckers from apple and plum trees should be cut away.

Raspberries should be looked over, and any old canes cut away. Leave three or four of the strongest canes to each stool. Remove any if growing too thickly, and form new plantations with these. Mulch the old and new plantations with half-rooted manure. On no account dig between the canes, otherwise you will disturb the roots, which grow near the surface.

Tomatoes should be gathered before the frost. If they are just turning colour, place them in a warm, sunny window to ripen. Unripe fruit may be used to make tomato pickle.

ANSWERS TO CORRESPONDENTS.

DURHAMITE.—I do not know that you can do better than drain the ground. I hope to touch on "draining" later on.

ANNOYED.—Try again. Your managers should certainly help you. Approach them as early as possible and point out the advantages. Get your application backed up by some of the parents.

DAHLIA.—The proper time to plant dahlias in the open is about the last week in May. (See former issues of the *Practical Teacher*.)

IPSO.—When applying soot, clays, or any other chemical manure, be careful to see that none of it touches the leaves.

BRIER.—Next month and December are suitable months to plant briers. They may, however, be put in in January or February, as long as the ground is not frozen.

N. B.—Personally, I should not plant standard trees, but should plant bush trees on the paradise stock. However, write to the manager, Barnham Nurseries, Sussex. He would, no doubt, advise you.

LAYERING.—Yes, I am a bit of a photographer, and am flattered to think that you are of opinion that the photographs of layering in last month "are not bad."

ORCHARD.—I should not like to say. Perhaps if you mixed plenty of old lime rubble with the soil before planting you might succeed with cherry and plum trees.

MISTRESS.—Many ladies are really successful gardeners. I would not suggest that you do all the rough digging yourself. Try and see, but bear two points in mind—firstly, wear thick boots (or even clogs); secondly, do not dig too much at a time.

TOOLS.—Gamage's of High Holborn could supply you. Write and ask for list of tools, etc., and mention the *Practical Teacher* when writing.

IPSO.—The specimen you sent me was not a good one. But I should say that the soil is deficient in lime.

INTERESTED.—Obtain "Suggestions for the Teaching of Gardening," known as Circular 746, issued by the Board of Education. It can be procured from Messrs. Wyman and Sons, Fetter Lane, E.C. Do not attempt too much at first. Glad to know that you have found the notes useful.

JAMES.—Apply to the Secretary, Royal Horticultural Society, Vincent Square, Westminster, for full particulars.

GRANT.—There are, I believe, upwards of twenty-eight thousand scholars, including girls, earning grant for instruction in "School Gardening."

BULBS.—Try Gamage.

The Teaching of Geography. By L. W. Lyde, M.A. (Blackie and Son. 1s. net.)

This excellent little book by Professor Lyde is practically a verbatim report of a series of lectures delivered by the author to teachers at the St. Andrews summer school. It can be strongly recommended, as it is clearly the work of an expert, and should be read by all teachers of geography.

The New Outlook Geography. By W. C. Brown, M.A., and P. H. Johnson, B.A. (George G. Harrap and Co. Book I., complete, 1s. 6d., or in two parts, 9d. each.)

This is one of the best courses which have come under our notice. The authors are rightly of opinion that the first lessons in geography should not be confined to a detailed study of the home region, but should be extended so as to include the countries of Europe and the continents of the world in decreasing detail. There are many practical exercises necessitating simple scale drawing, map-making, modelling, and direct observation. The matter is well arranged, the illustrations are numerous and good, and the exercises and practical problems will add a new interest to the geography lesson.

Experimental Geography. By G. E. Dingwall. (George Bell and Son. 2s. 6d. 166 pages.)

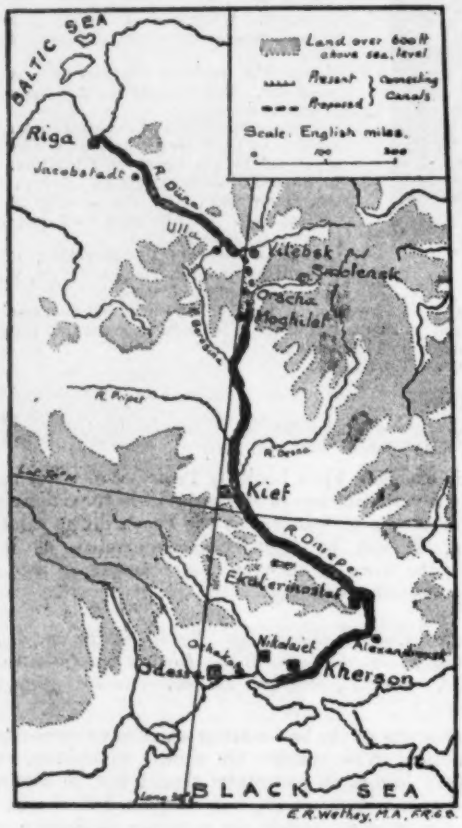
This text-book in practical geography aims at meeting the needs of pupils in secondary and higher-grade schools. It would also be very useful in the higher standards of an elementary school. The work is so arranged that the pupils are led from their own observations and experiments to find out the principles underlying the subject.

GEOGRAPHY NOTES UP-TO-DATE.

BY E. R. WETHEY, M.A., F.R.G.S.

A New Russian Waterway.

RUSSIA, having spent some £600,000,000 on railways within the last twenty or thirty years, is now preparing to follow suit on waterways. She is, of course, naturally well supplied with the latter, but they suffer from certain notorious defects. The immense area of her level plains renders them tortuous to a degree: the Volga, for example, traverses 1,650 miles from Tver to Astrakhan, though the direct distance between the two ports is only 900 miles. On the other



BALTIC — BLACK SEA WATERWAY.

hand, rapids occur to impede navigation on such important rivers as the Neva and the Dnieper. All are subject to ice-blocking in winter for at least two months in the year, and some of the northern rivers for as much as six months. Canal-building, however, has been easy, and connections of this sort between the various Russian seas are now matters of history. One of the two chief sets, the system uniting the Caspian and Baltic Seas, is of much commercial importance. The other, uniting the Baltic and Black Seas, by reason of shallower canals, a greater number of locks, and a large series of obstructions in the rivers themselves, has never been particularly successful. This system is little used, except in certain favoured districts, by big boats. Undecked flat-bottomed barges and timber rafts alone can traverse it from end to end.

There have been many schemes and plans to improve this state of affairs since the first great connecting canal was finished in 1804. This was what is known as the "Beresina System," and by it the Düna was linked up with the Dnieper, *via* Ulla and the historic Beresina. Not one of these schemes has as yet fructified; but since 1907 one has been looming nearer and nearer, and a government department is now engaged in conducting surveys and negotiations which seem to promise something definite in the end.

A glance at the physical map shows the obvious route of any Baltic to Black Sea canal in this part of Russia. Both the Düna and the Dnieper rise in that fount of Russian waterways, the north-west end of the Central Plateau, and their courses lead more or less directly to the two seas interested. The connecting link between the two should come, if possible, just where the one turns north and the other south. The valleys of the Inscheza at Vitebsk, and of the Orschiza at Orscha, appear made for the purpose, and this accordingly is the new route selected. A couple of convenient lakes on the watershed—between 400 and 500 feet above sea-level—may be connected in a joint reservoir for "feeding" purposes. But to make the job a complete one—that is, to produce a canal which shall carry boats of, say, 800 or 900 tons, and nothing less than this will satisfy the commercial spirits of the government—will be an expensive affair. The estimate alone—and canal "estimates" are seldom *below* the ultimate mark—runs up to nearly £20,000,000. A writer in a recent issue of the *Times* says that it is calculated at 155,000,000 roubles (9¼ roubles to the £1), and works it out in sections as follows:—

	Roubles.
1. The Düna (the rapids) between Riga and Jacobstadt	21,000,000
2. The Düna between Jacobstadt and Vitebsk	11,000,000
3. The Düna-Dnieper Canal	26,500,000
4. The Dnieper between Orscha and the mouth of the Beresina	5,000,000
5. The Dnieper between Beresina and Ekaterinoslaf	42,000,000
6. The Dnieper rapids	20,000,000
7. The Dnieper between Alexandrovsk and Kherson	6,000,000
8. Machinery, management, and interest	23,500,000
	155,000,000

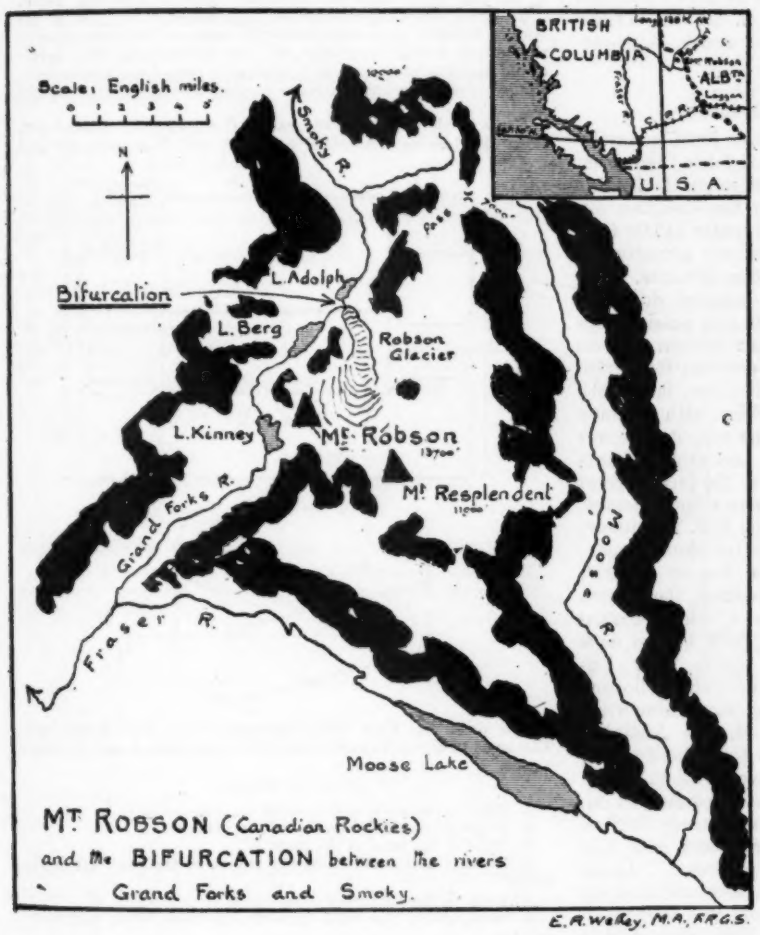
Some of these sections call for special remark. Nos. 1 and 6 are typical examples of the "rapids" difficulty, already alluded to as one of the main drawbacks to navigation on certain of the Russian rivers. The Düna rapids below Jacobstadt effectually block the way to all large vessels except at high water, while the Dnieper rapids are even more obstructive. They extend for some thirty to forty miles between Ekaterinoslaf and Alexandrovsk. It is very rarely indeed that a cargo boat tackles them at any time, and this although numerous artificial channels have been constructed since 1852 to avoid them. It will be noticed that these two rapids alone account for nearly one-third of the estimated expense of the whole waterway. Possibly dam constructions for the purpose of reducing the falls may solve the difficulty. Nos. 2 and 4 simply involve canalising the upper waters of the two rivers; at present the upper Düna cannot carry a boat of even 100 tons burden, and as a result the Vitebsk to Riga railway has taken to itself all the old riverain traffic except timber. No. 3 is the new connecting link to replace the existing Ulla to Beresina connection. No. 7 is capable of taking boats of as much as 55,000 pouds, or between 900 and 1,000 tons, since the deepening of the bar at Ochakof; and No. 5 could do far better work

at the present time if it were not for the paralysing influence of the rapids immediately below. No. 8 is not a geographical point, and may be left as a more or less speculative item.

Here the natural question arises, *Cui bono?* First of all, the whole district is rich in natural resources. Wheat (from the Black Earth region), rye, timber, flax, hemp, and sugar-beet are the most important.

Secondly—and incidentally—there are immense possibilities for all towns and villages in the neighbourhood of the various rapids and waterfalls of the two main rivers and their tributaries. For the government hopes to pay for the canal more by the exploitation of water-power than by the imposition of tolls. The Commission of Inquiry, which is now sitting, and which is expected to finish its labours by the end of the year, is already confident that the Düna rapids will be able to furnish 100,000 horse-power, and the Dnieper 150,000. These are large figures, and mean a probable revenue alone of from 12,000,000 to 15,000,000 roubles—nearly enough, *with the tolls*, to make the whole undertaking financially practicable.

Finally, three towns especially stand to gain enormously—Riga, Kherson, and Kief. Riga is Russia's third port, and what is more interesting to us, 33 per cent. of its trade is with the United Kingdom. Kherson is already a rival to Odessa, and is actually situated in a more convenient locality for receiving and transmitting the grain exports of the south-west. It has a large export, too, of hides and timber, and is in touch with Nikolaief, now the chief naval station on the Black Sea. Kief is, in the words of the commercial geographer, the *entrepôt* of the Dnieper basin, and that means much. One does not realise all at once "space" in Russia. The drainage area of "Father Dnieper"—as the Little Russians call their great river—is larger than the whole of France; of its tributaries the Beresina is longer than any British river, and the Desna nearly three times as long as the Thames; and the Beresina and Desna converge on to Kief. Its sugar refineries and leather works and "six miles of houses along the river bank" should contemplate this new waterway as something specially designed for their development and interest. And from the other point of view, with a town like Kief in the middle, and two open seaports as its termini, the waterway itself should be confident of the future.



A New "Bifurcation" and a Geographical Dilemma.

"Bifurcation, the division of a stream into two parts, each of which connects with a different river system"—so runs the well-known definition. The difficulty the teacher of geography has is to meet with good concrete examples of what is in the nature of things bound to be a somewhat rare phenomenon. The stock example is, of course, the Cassiquiare, which, on the indefinite "watershed" between the Amazon and the Orinoco, actually branches off from the main stream of the Orinoco to reach the Amazon eventually by way of the Negro. The latest example comes from America—*British* America this time. One of the many head waters of the Fraser River emerges from a glacier at the foot of Mount Robson, in the Canadian Rockies, and almost immediately *bifurcates* into two lakes—Adolph and Berg. From Lake Adolph the stream goes *north*, and develops into the Smoky River on its long journey to the Arctic Ocean *via* the rivers Peace and Mackenzie. From Lake Berg the other branch flows *south* to the Grand Forks River, and so reaches the Pacific Ocean *via* the Fraser River. School atlases may be searched in vain for this striking instance, for the district has only recently been explored, and the ordinary maps are very hazy in the matter, both of names and places. The accompanying map has been compiled from an article and map by Professor Coleman of Toronto University in the July number of the *Geographical Journal*. The professor was the first white man to set foot on Mount Robson, and conse-

quently to make this new discovery (1908). Incidentally the bifurcation leads up to a curious geographical puzzle. Smoky River is in Alberta; Grand Falls River is in British Columbia. The boundary line between the two provinces is determined in the north by the meridian 120° east, and in the south by the watershed separating the eastward from the westward flowing rivers. This Mount Robson region is in the southern portion, and has always been supposed to lie within the British Columbian sphere—that is, west of the true watershed. Here, then, is a question for the political quidnuncs to determine—Which part of Mount Robson, of Robson glacier, and of the Upper Smoky to Grand Forks belongs to which province? We will leave it at that what time the Grand Trunk Railway pushes on for the Yellow Head Pass, a short distance to the south, and precipitates matters.

The Ascent of Mount Robson.

Meanwhile the ascent of the mountain itself is worthy of a passing notice. Though its existence had been known during the last fifty years and more, its heights had never been attempted prior to the Coleman expedition of 1907. Its summit is just under 14,000 feet, and is therefore one of the highest, if not actually the highest, of all the British Columbian Rockies. Not until the boundaries of Alaska are reached does one meet with 7,000 or 8,000 feet of *névé* and glacier such as one finds on the north side of Mount Robson. Moreover, it lies in a very unfavourable position for mountaineers. Well on the west of the Rockies, facing the Pacific and the south-westerly winds, with nothing higher than itself between it and the sea, its summit is cloud-hidden for days at a time, and any attempts to scale it have to be carried out in the face of great climatic obstruction. Professor Coleman's first attempt, in conjunction with his brother and the Rev. E. Kinney, was a hopeless failure. The party started from Laggan, on the Canadian Pacific Railway, on August 2, 1907. Unexpected difficulties *en route* prevented them from reaching the Fraser until September 4, and continual rain and snow finally turned them back twelve days later. They got no higher than 6,000 feet. Undaunted, they made another attempt the following year. This time they tried starting from Edmonton. They engaged an Iroquois half-breed, one Adolphus Moberly (hence Lake *Adolph?*), who took them a long forty-mile round up the Moose River Valley. They reached the north side of Mount Robson by August 24, discovered the "bifurcation," and made ready for the ascent. For a week there were incessant rain and snow. "Every morning," says the professor, "I rose at 3.30 to look at the weather, and then turned in again when the upper part of Mount Robson was invisible." To cut the story short, they made the attempt, but were again foiled by the weather, though not before they had attained an elevation of 11,300 feet. That was on September 12. Their last glimpse of the mountain showed "its summit shrouded as usual with a gray cloud, from which snow was driving aloft and little spots of rain drifting into the valley." The third attempt, arranged for 1909, was successful. The clergyman forestalled the professor, who was unable to leave his duties in time, and reached the summit on August 13, making his way round the west shoulder of the mountain. Those who are interested will find some excellent photographs of the region in the article of the *Geographical Journal* already alluded to.

A NEW COURSE OF PRACTICAL AND CONSTRUCTIVE WORK,

ARISING OUT OF AND COMBINED WITH THE ORDINARY SCHOOL SUBJECTS.

For Junior, Middle, and Upper Divisions of Primary Schools.

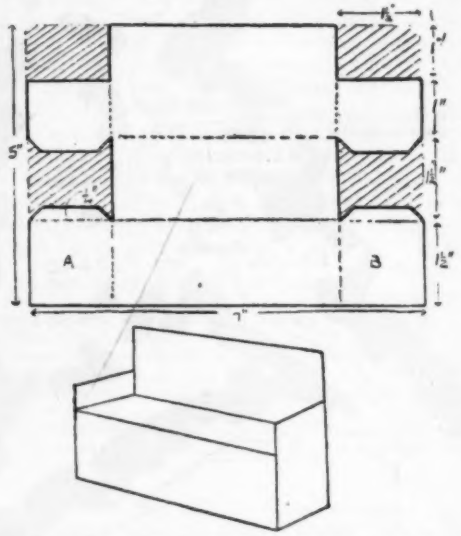
BY A. R. PICKLES, M.A., AND DALTON GRANGE.

MIDDLE COURSE.

Lesson 44.—Paper Modelling: The Settee, introducing the Half in Multiplication.

SIZE of paper required: ordinary sheet of drawing paper. Thick drawing or coloured paper should be used in the middle division, as a step from the ordinary coloured paper of the juniors to the cardboard, etc., of the seniors. The covers of old drawing and exercise books have been used successfully, where these are not so porous as to absorb the adhesive material used.

Draw as shown in the diagram. Cut away the shaded portion. Fold along the dotted lines. A and B support the seat



at the sides, the flaps being fastened to the top of the seat. The arms of the settee are fastened to the parts A and B afterwards.

Some Questions.

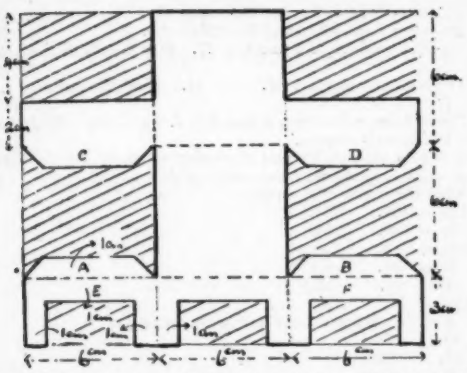
1. What is the area of the seat?
2. Write down the perimeter of the seat.
3. What is the area of the back?
4. Measure and write down the length of the diagonal of the back.
5. What is the perimeter of the back?
6. Write down the total area of the back, seat, and front portion.
7. What is the area of one end?
8. How much paper has been used altogether? (Omit the flaps.)
9. What is the area of the arm?
10. How many times more paper in the seat than the arm?

Answers.

1. 6 sq. in.	6. 20 sq. in.
2. 11 in.	7. 3½ sq. in.
3. 8 sq. in.	8. 27½ sq. in.
4. 4½ in. (about).	9. 1½ sq. in.
5. 12 in.	10. 4 times.

Paper Modelling: Armchair.

Draw as shown in the diagram. Cut away the shaded portions. Fold along the dotted lines. The flaps A and B



are gummed on the top of the sides of the seat, C and D being gummed to the parts E and F.

SOME QUESTIONS.

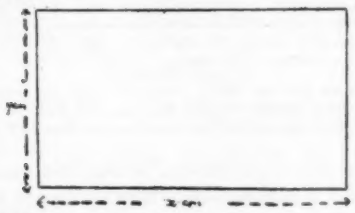
1. What is the area of the back ?
2. Give the area of the seat.
3. How much has been cut away from the side of the chair ?
4. How much has been cut away from the sides and the front ?
5. What would be the area of one side if none had been cut away ?
6. Of both sides and the front ?
7. What *is* the area of both sides and the front ?
8. How much paper in the chair ?
9. What is the perimeter of a side of the chair—that is, the arm and the leg ?
10. Measure the diagonal of the back of the chair.

Answers.

1. 36 sq. cm.	6. 78 sq. cm.
2. 36 sq. cm.	7. 54 sq. cm.
3. 8 sq. cm.	8. 126 sq. cm.
4. 24 sq. cm.	9. 26 cm.
5. 30 sq. cm.	10. 8½ cm.

LESSON 45.—THE ALGEBRA OF THE RECTANGLE: ITS SIDES.

1. Draw a rectangle 7 cm. by 4 cm., but instead of calling the sides so many cm. long, call the longer side x cm. and the shorter side y cm.



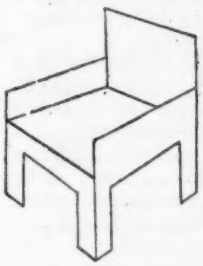
2. What is the length of the two long sides of the rectangle ? the two short sides ? What does $2x$ mean ? $2y$? How many cm. are $2y$ cm. ? Draw $2y$ cm. Draw a line y cm. long. Draw a line $2x$ cm. long. Now write in your book what $2x$ means.

($2x$ means $2 \times x$.)

3. Draw a line x cm. long. Add to its end a line y cm. long. What is the length, using figures, of the new line ? What is the length, using letters, of the new line ? Perhaps some of the pupils will give the answer xy cm. If so, proceed as follows. What does $2x$ mean ? $2y$? $3y$? etc. ; xy ? ab ? cd ? If the answer were xy cm., and $x = 7$ cm., $y = 4$ cm., what would xy cm. equal in actual cm. ? (28 cm.) What is the actual length in cm. ? How many cm. too long is xy ? How many times too long is it ? Why is xy wrong ? What must we do to find the length of the new line ? How could I write down the sum of x cm. and y cm. ? A boy has a marbles. He wins b marbles; how many has he then ? In a class there are c boys and d girls; how many in the class ? etc.

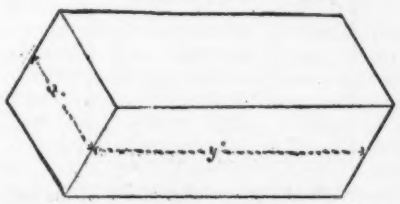
4. When $m = 4$ cm. and $n = 3$ cm. Draw—
(a) $m + n$.
(b) $m - n$.
(c) $2m + n$.
(d) $3n - 2m$.
(e) $m + 2n$.

5. *The Square Prism.*—What is the length of your square prism ? the length of a short side ? We will say the long side is r cm. and the short side is s cm.



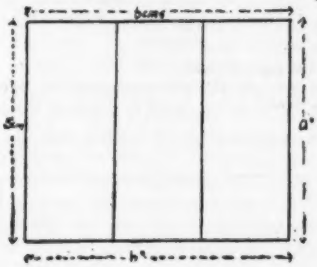
(a) What is the sum of a short edge and a long edge ?
(b) The sum of two long edges and two short edges ?
(c) The perimeter of a long face ?
(d) The perimeter of a square face ?
(e) The difference between four long edges and four short edges ?

6. This represents a square prism.
(a) How much longer is a long side than a short side ?
(b) What is the total length of a long side and a short side ?
(c) What is the length of all the short edges seen in the drawing ?



(d) Of all the long edges seen in the drawing ?
(e) Of all the edges seen in the drawing ?

7. Draw in your books :—
(a) Write down the perimeter of this rectangle in inches. ($2a + 2b$ in.



(b) What is the difference between one long side and one short side ? (($b - a$ in.), or 1 cm.)
(c) What is the difference between two long sides and two short sides ? (($2b - 2a$ in.), or 2 cm.)
(d) What is the sum of all the long lines in the drawing ? (12 cm., or $2b$ in.)
(e) All the short lines ? ($4a$ in., or 20 cm.)
(f) All the lines ? (32 cm., or $4a + 2b$ in.)

8. Work the following :—
(a) $6s \times 7$. ($42s$.)
(b) $3m \times 8$. ($24m$.)
(c) $7v \times 9$. ($63v$.)
(d) $5a \times 4$. ($20a$.)
(e) $8b \times 5$. ($40b$.)

9. (a) A rectangle is $2s$ feet long. How many inches is this ? ($24s$ in.)
(b) One edge of a cube measures t feet. What is the length of all the edges in inches ? ($144t$ in.)
(c) The distance round a playground is b yards. How many feet is this ? ($3b$ ft.)
(d) The diagonal of a square measures $2a$ dm. What is this length in cm ? ($20a$ cm.)
(e) One of the square ends of a square prism measures $2m$ in. What is the total perimeter of both square faces ? ($16m$ in.)

10. Find the value of x when—
(a) $4x = 36$. (9.)
(b) $5x = 35$. (7.)
(c) $7x = 49$. (7.)
(d) $9x = 27$. (3.)
(e) $11x = 121$. (11.)

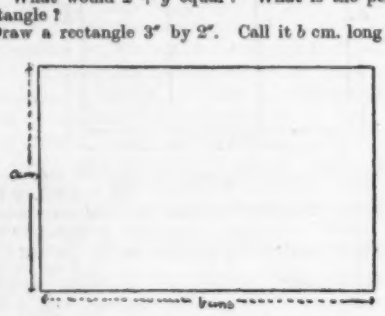
11. (a) The perimeter of a square measures $24d$ in. Write down the length of one side. ($6d$ in.)

(*b*) The side of a garden is $33x$ feet. What is its side in yards? ($11x$ yds.)
(*c*) All the edges of a cube together measure $144x$ cm. What is the length of one edge? ($12x$ cm.)
(*d*) All the sides of a rectangle together measure $72a$ in. What is this perimeter in feet? ($6a$ ft.)
(*e*) What is it in yards? ($2a$ yds.)
12. $d = 1\frac{1}{2}$ in.
(*a*) Draw the oblong face of a square prism whose long side measures $3d$ and whose short side measures d.
(*b*) What is the perimeter of this face? ($8d$.)
(*c*) What is the perimeter of the square end? ($4d$.)
(*d*) What is the length of all the long edges of the prism? ($12d$.)
(*e*) Of all the edges? ($20d$.)

The Area of the Rectangle.—Algebra.

13. Construct a rectangle 6 cm. by 4 cm. Call it y in. long and x in. broad.

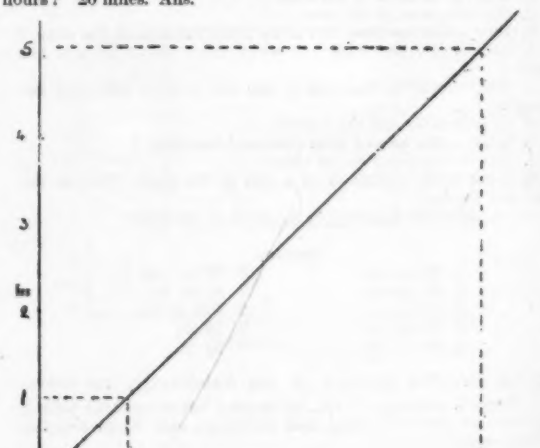
What is the length of the two long sides? of the two short sides? What does $2y$ mean? $2x$?
A square has a side of m in.; what is its perimeter? What does $4m$ mean?
Write down the product of the following:—
(*a*) 5 and x.
(*b*) 6 and r.
(*c*) 7 and p.
(*d*) 3 and b.
(*e*) x and y.
Write down the sum of each.
What is the area of the above rectangle? What does xy mean? What would $x + y$ equal? What is the perimeter of this rectangle?
14. Draw a rectangle 3″ by 2″. Call it b cm. long and a cm. wide.



(*a*) Write down the area of this rectangle.
(*b*) What would be the area of five such rectangles?
(*c*) What is its perimeter?
(*d*) Find the difference between the sum of two short sides and the sum of two long sides.
(*e*) If the rectangle were 1 cm. longer, what would be its length?
15. $a = 3$ in. $b = 2$ in. Draw—
(*a*) $a + b$.
(*b*) $a - b$.
(*c*) $2b - a$.
(*d*) $2a - b$.
(*e*) ab.
16. $a = 6$. $b = 4$. Write down the value of—
(*a*) ab. (24.)
(*b*) $a + b$. (10.)
(*c*) $2ab$. (48.)
(*d*) $2a + 2b$. (20.)
(*e*) $5ab$. (120.)
17. (*a*) $xy = 27$, $x = 3$; find the value of y. (9.)
(*b*) $ab = 54$, $b = 6$; find the value of a. (9.)
(*c*) $cd = 120$, $c = 12$; find the value of d. (10.)
(*d*) $mn = 36$, $m = 9$; find the value of n. (4.)
(*e*) $rs = 35$, $s = 7$; find the value of r. (5.)
(*f*) $uv = 6$, $u = 6$; find the value of v. (1.)
18. (*a*) The product of a and b is 27. $b = 9$. Find the value of a. (3.)
(*b*) The sum of r and s is 81. $r = 34$. Find the value of s. (47.)
(*c*) The difference between a and b is 6. $a = 14$. Find their sum, if b is greater than a. (34.)
(*d*) $x + y = 14$, $x = 6$; find the value of xy. (48.)
(*e*) $cd = 36$, $c = 4$; find the value of $d \div c$. (5.)
19. Find the value of x when—
(*a*) $11x = 121$. (11.)
(*b*) $8x = 136$. (17.)
(*c*) $12x = 240$. (20.)
(*d*) $9x = 81$. (9.)
(*e*) $7x = 91$. (13.)
(*f*) $13x = 39$. (3.)
20. $x = 7$. What do the following equal?—
(*a*) 21. ($3x$.)
(*b*) 56. ($8x$.)
(*c*) 49. ($7x$.)
(*d*) 84. ($12x$.)
(*e*) 112. ($16x$.)

Graphic Arithmetic.

A man walks 4 miles an hour; how far will he walk in 5 hours? 20 miles. Ans.

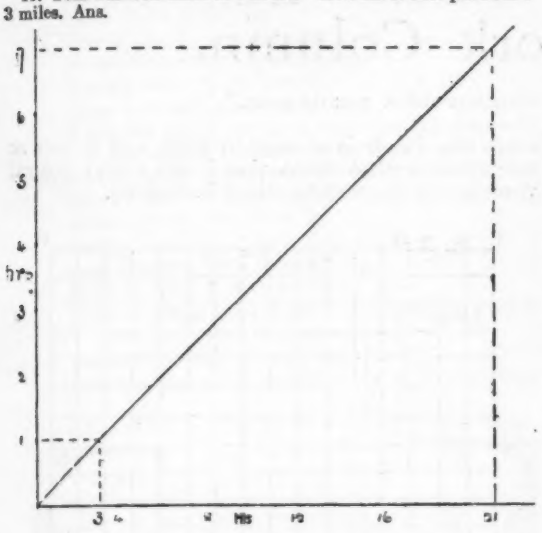


Other questions on the same diagram may be asked; for example, How long would it take the man to walk 12 miles? 9 miles? etc. How far would the man have walked in 2 hours? $2\frac{1}{2}$ hours? etc.

Some Questions to be Worked on Squared Paper.

1. A boy walks 3 miles an hour. How far does he walk in $4\frac{1}{2}$ hours? ($13\frac{1}{2}$ miles.)
2. John walks 3 miles an hour, Tom $3\frac{1}{2}$ miles. How far apart are they in 6 hours? (3 miles.)
3. Harry walks $3\frac{1}{2}$ miles an hour. He sets off for B, a town 20 miles distant at 12 o'clock. How far from B is he at 4 o'clock? (6 miles.)
4. A train going at 30 miles an hour reaches a town X 180 miles away in how many hours? (6 hours.)
5. A sailing boat goes at 10 miles an hour. How far is it at the end of 5 hours if it has lost one hour on the way? (40 miles.)
6. Tom walking $2\frac{1}{2}$ miles an hour, and Robert walking 3 miles an hour, start at the same time to walk to X. When Tom has travelled 15 miles, how far has Robert gone? (18 miles.)
7. A boy travelling 3 miles an hour walks to a place 16 miles away. How long does it take him? ($5\frac{1}{3}$ hours.)
8. A steamer goes 20 miles an hour. When does it pass an island 50 miles away? (In $2\frac{1}{2}$ hours.)
9. John's father walks 6 miles an hour, John 3 miles. The latter has two hours' start. How far has he gone when his father overtakes him? (12 miles.)
10. A boy walking 4 miles an hour is given a start of 1 hour. He is overtaken by his father when he has walked 20 miles. How many miles was the father walking per hour? (5 miles.)

11. Tom walks 21 miles in 7 hours. How far is that per hour? 3 miles. Ans.



SOME EXERCISES.

1. John walks 20 miles in 4 hours. How far is that in 1 hour? (5 miles.)
2. A man walks 27 miles in 4½ hours. How far is that in 1 hour? (6 miles.)
3. How many hours does a man walk, if he walks a journey of 35 miles at 3½ miles an hour? (10 hours.)
4. A man walks 30 miles in 5 hours. How long does it take him to walk 18 miles? (3 hours.)
5. A sailing vessel sails 48 miles in 6 hours. How far does it sail in 3½ hours? (28 miles.)
6. A train goes 150 miles in 6 hours. How long does it take to go 125 miles? (5 hours.)
7. A train travels 150 miles in 5 hours. When does it pass a station 105 miles away? (3½ hours.)
8. Tom walks 4 miles an hour. John gives Tom an hour's start. They reach their destination 20 miles away at the same time. How many miles per hour is John walking? (5 miles.)
9. A train starting at 10.30 reaches Y, which is a distance of 140 miles, at 4.30. A breakdown has caused a delay of 1 hour. What speed had the train when in motion? (28 miles an hour.)
10. A steamer is on a journey of 128 miles. It passes a lighthouse 48 miles from its journey's end in 5 hours. When does it reach its destination? (In 8 hours from starting.)

(To be continued.)

SONGS FOR THE GIRLS' SCHOOL.

BY FLORENCE B. HYETT.

NOW that our national folk-songs have come into their own, our singing lessons have awakened in us a new interest. The lesson, instead of being neglected, is receiving much attention, and occupies an important place on all our modern time-tables. If we proceed as we have started, no one should be able to say of the next generation that the English are not a music-loving nation.

Not only do we give more time to singing, but we are beginning to realise that it is necessary to teach the child *how* to sing; hence our attention to voice production and our endeavours to eliminate the harsh and strident tones which have been so common amongst the children in the public schools.

With the cultivation of the "head voice" has come a renewed attention to expression, and with the resurrection of the folk-song has come a renewed attention to the purity and clearness of our enunciation in singing.

It is often difficult, however, to choose songs that are simple but effective. To get effective singing we must select songs that lend themselves to sympathetic and expressive production. Again, there is not only the tune to be considered. In choosing a song I always consider the words. Will they lend themselves to an effective rendering? Too often the air is taught and the words are roughly fitted to it. That song is never artistically sung by the children. The words should be thoroughly taught, attention being paid to purity of the vowel sounds, the final consonants, and special attention paid to the aspirate. Just as much care should be given to the words of a song as to a recitation. Then the singing becomes an art, for the song can be interpreted artistically, and attention given to the production of the voice.

For national songs one cannot do better than get Boosey's *National Song Book*, words and music for a shilling. In that collection will be found songs suitable for every class, such as "It was a Lover and His Lass," "Blow, blow, thou Winter Wind," "Sigh no more, Ladies," "Under the Greenwood Tree," and many more favourites. In the *Golden Treasury of Song*, by the same publishers, a splendid selection for the elder girls will be found, notably Schubert's "Who is Sylvia?" and two very effective two-part songs, "Gather ye Roses while ye may," and "The Wanderer's Night Song."

Leaving the national songs, I would advise every teacher to procure and teach some of Liza Lehmann's charming melodies. The children love them, and they will inculcate a love of sweet and delicate music. Those I have found most suitable for school use have been in the volume known as *The Daisy Chain*, a collection of twelve songs. Although the book is five shillings, it is worth adding to the collection of any school. "The Moon," words by Robert Louis Stevenson, is set to most effective music, and can be sung either with or without the accompaniment. It is suitable for any class, the younger children, of course, being helped with the harder passages. The famous setting to Miss Alma Tadema's "If no One ever Marries Me" is also among the collection, and is most dainty. "Fairies" is also very pretty. The other book I have used—a *Book of Bird Songs*, price three shillings and sixpence—has in it five sweet songs. "The Owl" was learnt by Standard I.; "The Wood Pigeon" is suitable for older girls; "The Starling" is very pretty, but needs the accompaniment to complete it.

Another book, much cheaper—I believe it is a shilling—"Wind Flowers," music by Dr. Somervell, contains some very pretty songs. The rhythmic setting to Stevenson's famous little poem, "All around the House is the Jet Black Night," has quite a weird effect, and is quite simple. Several others in the book are very suitable for school use.

The old song, "Now is the Month of Maying," is in the *National Song Book*, already mentioned. The famous "Hark, Hark, the Lark," set to Schubert's music, is loved in every girls' school. "The Cuckoo," published at two shillings, by Liza Lehmann, is a charmingly effective song for the springtime.

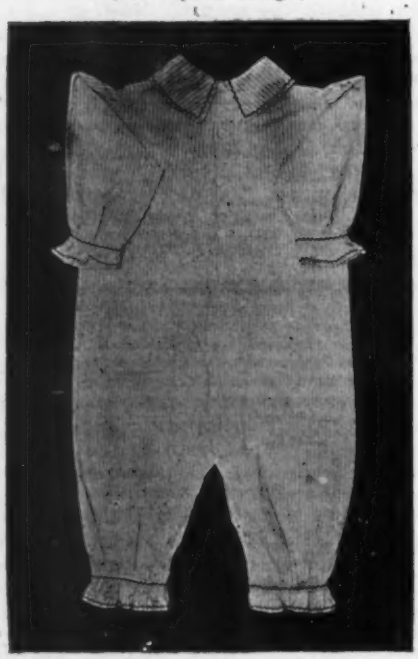
These are just a few of the songs that have been tried and found successful. Their freshness has only added to their charm, and both teacher and children have enjoyed learning them.

Our Needlework Column.

BY J. A. FLEMING, AUTHORESS OF "COMMON-SENSE NEEDLEWORK."

COMMON-SENSE COMFORTABLE CLOTHING FOR CHILDREN.

CHILD'S SLEEPING SUIT.
(2 to 5 years of age.)



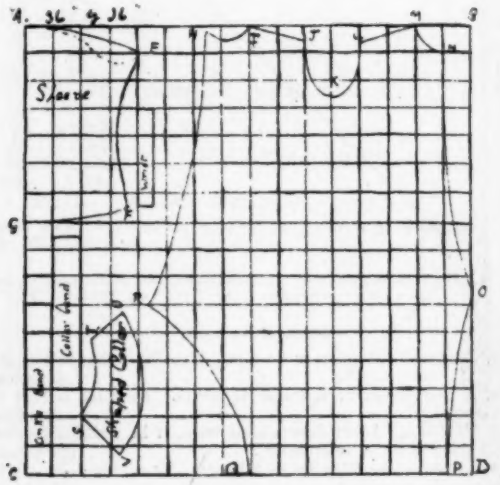
HYGIENIC principles are spreading among the more thoughtful women, who now clothe their little ones in woollen garments of every description.

Young children are often so restless in bed that many careful mothers are adopting the sleeping suit for both boys and girls, particularly delicate ones. It is especially recommended for children that are prone to chills.

The illustration was made up in wincey, but flannel, viyella, union, and stockingette material may all be used. Soft white calico and longcloth are also serviceable and dainty. The method of putting the various parts together would be practically the same in any material.

Flannelette will no doubt be adopted, but its inflammatory nature renders it very dangerous for little ones who play about the fireside before being dressed.

If, however, a non-flammable make be selected, or if the garment be *always* washed in alum water or something else that renders the material less liable to burn, one reason for objecting to its adoption is nullified. It must be remembered, however, that there is *no* wool of any kind in its composition. It is made *entirely* of cotton; the preparation (by roughing up its surface, which makes it burn so easily) and its misleading name account for the erroneous impressions concerning it. It is so easy to wash, and it *feels* so much warmer than calico, that it has a very general vogue among the working classes in England.



To make the Pattern.—Take a 26″ square of paper. This will make a garment to fit a child two or three years of age; but the pattern can be adapted to fit an older one if the square of paper equals the full bust measure, plus 8″.

In this instance it will be better to use the paper single than double. Double it four times each way. Open it out, and mark the corners A, B, C, D.

Note.—It will be found that the various points come to halves and thirds of a division. The figures refer to spaces or divisions, *not* to inches.

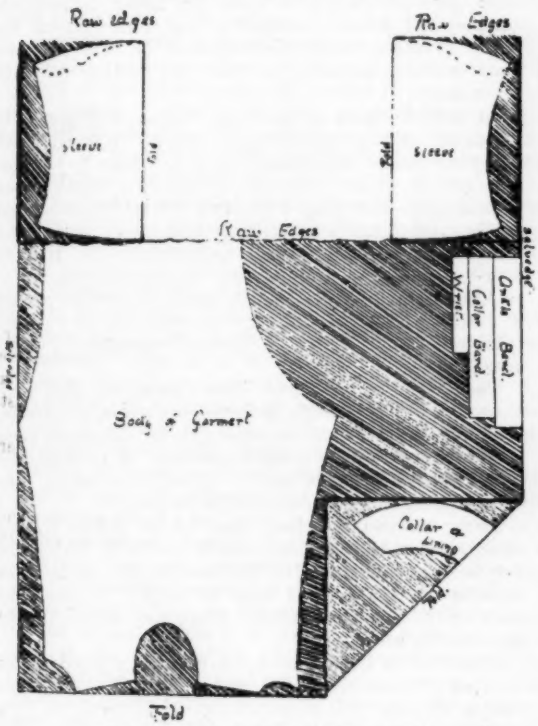
Sleeve.—From A mark E 4 in and 1 down.
Draw a curve from A to E.
From A mark F 6½ down and 3½ in.
Draw a curve from E to F.
From A mark G 7 down.
Draw a curve from F to G.

Note.—The sleeve pattern will have to be cut out and laid on double paper to get the under arm curve indicated by the dotted lines.

To draw the Garment.—From A mark H 6½ in and ½ down.
From B mark I 8 in.
Draw a curve from H to I.
From B mark J 6 in and ½ down. Join I and J by a straight line.
From B mark K 5 in and 2½ down.
From B mark L 4 in and ½ down.
Draw a curve from J to L, passing through K.
From B mark M 2 in.
Join L and M by a straight line.
From B mark N 1 in and 1 down.
Draw a curve from M to N.
From B mark O 9½ down.
Draw a curve from N to O.
From D mark P 1 in.

Draw a curve from O to P.
From D mark Q 8 in.
Join P and Q by a straight line.
From C mark R 6 up and 4½ in.
Draw a curve from Q to R.
Draw a curve from R to H.
Turn the paper round so that line CA comes to the top, and commence to draft.

Shaped Collar.—From C mark S 2 in and 2 down.
From C mark T 4⅜ in and 2⅛ down.
Draw a curve from S to T.
From C mark U 5⅜ in and 3½ down.
Join T and U by a straight line.
From C mark V 3½ down and ⅜ in.
Draw a curve from V to U, just coming outside the line which it crosses.
Connect V and S by a straight line.
The drafting of the bands needs no instructions.



Pattern laid on 2½ yards of 36″ material.

Cutting out in Material.—Two and a half yards will be needed. It will be seen from the diagram that the body of the garment is laid on double material, and that the remaining portion is cut up the middle so as to turn back and fold over. The straight line of the sleeve is placed to a fold.

Pin the paper and the doubled material together, and cut carefully through both thicknesses.

The sleeves face each other properly in this position. The shaped out under part should now be cut.

The body of the garment being cut out, the fold is cut across to allow a corner to be turned back, so that the back of the collar may be placed to the perfect cross. The bands can be cut as indicated :—

Ankle bands, 13½″ by 2½″.
Wrist bands, 7½″ by 1¼″.
Collar bands, 12½″ by 2¼″.

Making Up.—Join the leg seams by run-and-herringbone. Join both halves of the garment up the front. Make a hem on each side of the back, and apply four or five buttons and buttonholes.

Join the shoulder seams.

Make the ankle frills by laying a narrow hem at the bottom of the legs on the wrong side, and featherstitching it in white or some contrasting colour on the right side.

Lay pleats about 1½″ above the hem to form a frill.

Join the ankle band and turn in the raw edges on the wrong side. It is easier to featherstitch the band before setting it on to the garment, which is done by hemming or stitching each edge.

Frills of this kind have a double advantage for children's wear. They make a pretty finish to what is often an unattractive woollen garment, and the band may be taken off the garment and sewn on to the *edge* in the event of the garment becoming short by the running up in washing or the rapid growth of the child.

Collar.—Run the collar and lining together near the edge, except round the neck curve.

Turn it inside out, and tack it all round to keep the two thicknesses in place, and featherstitch.

The straight collar band is cut in two, lengthways, to allow the shaped collar to be inserted between its upper edges by means of a run-and-backstitch. Stitch up the ends. Turn in the lower edges of the band. Pin the middle of the neck to the front seam, and tack it to the garment, making the ends fit neatly. Stitch it to the garment. Turn it over, and hem it on the wrong side.

Sleeves.—Make the joins to correspond with those on the garment. Also make the frills and bands to correspond with those on the ankles.

A *shaped* sleeve (one with a double curve at the top) requires a little more skill to fit it to the garment than does a simple shirt sleeve. The shaped sleeve seam does *not* meet the side join, but is placed from ¾″ to 1½″ nearer the front. It is better to put the garment on to the wearer, and place the sleeve where it fits best, inserting a pin exactly where the sleeve meets the side join. Now lay the sleeve flat on the table, and place another pin opposite the first one. The second one indicates the top of the sleeve, which is the point where it will join the top of the armhole. Pin the two together in that place, and confine all fulness, whether gathered or pleated, between 1½″ and 2″ on each side of the pin.

Lay a small boxpleat at the top, and flat single ones on each side. Stitch the two together, and either bind with galloon or herringbone the sleeve down on to the garment.

ANSWER TO CORRESPONDENT.

CHATTERIS.—I wish you had given me some details of your proposed scheme of work, so that I could have answered more fully your request for the "stock required for one year's course of needlework in an evening continuation class of about sixty girls." Not knowing whether you intend to teach plain or fancy needlework or dressmaking, or, as is more commonly the case, two of the branches, or whether the girls have attended any previous class or not, I am in some doubt how to advise you.

In my own town the scheme of evening work in continuation schools demands that every lesson in which fancy needlework is taken shall be preceded by at least one hour's instruction in plain needlework.

Students in dressmaking are *expected* to have received prior instruction in plain needlework. Our scheme includes drawing patterns, by measurement, of any undergarments for men, women, and children's wear, and also for the making of a shirt blouse or slip bodice.

Further, our education committee expects students to provide their *own* materials for any article or garment they may make, subject in each case to the teacher's approval. That being so, the committee provides *only* what the teacher requires for demonstration lessons and for the teaching of any particular exercise.

The application of the exercise to any special article, as I have already said, is carried out at the pupil's own cost.

If you intend doing any pattern drawing, which is very essential for a continuation class, proper exercise books and paper for drawing and drafting the patterns will be needed.

Having no data whatever to go upon, and desiring to be of service *at once*, I am taking it for granted that you will proceed on similar lines to those indicated above, and have therefore drawn up the following list after carefully examining several requisition forms just sent in *for this season* by experienced teachers of such classes:—

6 dozen needlework or drawing books.
6 dozen lead pencils.
6 dozen coloured pencils.
72 sheets brown paper.
10 quires cutting-out paper (large).
5 quires cutting-out paper (small).
3 quires coloured tissue-paper.
12 quires lined paper.
6 yards ivory canvas.
6 packets wool needles.
12 balls coloured lustrings.
12 yards white calico.
12 packets sewing needles.
3 cotton reels.

If this does not meet your requirements, please give me full details, and I will do my best to help you.

Your letter reached me two days after I had returned from my holiday in your county. Eastbourne is the loveliest seaside resort I have visited in England, not excepting our own beautiful Scarborough.

The "K. G." Toy Box: A Correlated Occupation for the Little Ones. By Isabel A. Otty. (E. J. Arnold and Son, Ltd.)

This book shows how the traditional fairy tales can be connected with varied occupations for the little ones, and consequently it is quite in the movement originated, or at least popularised, by Miss Catherine I. Dodd. Miss Otty's volume is full of suggestive material, and teachers will find all necessary details of the work clearly set forth.

According to the new plan the child learns—

"My dolly is so sleepy,
I don't know what to do;
I think I'll make a little cot,
And put her in it too."

No sooner said than done. On page 27 we see how to "make the little cot." It is dangerously suggestive of Squeers, who seems to be coming into his own in these days.

MODERN SCIENCE NOTES.

BY J. G. M'INTOSH, B.SC., SECONDARY SCHOOL, GATESHEAD.

The Scale Investigation of Salmon and Sea Trout.

MUCH water has flowed through London Bridge since "Piscator" "stretched his legs up Tottenham Hill" to go a-fishing to Ware. It is only within the last few years, however, that a knowledge of the life history and habits of the salmon has made any advance upon the erroneous theories of Walton and his contemporaries.

The systematic work of the Scottish Fishery Board, the observations of Calderwood, Malloch, Hutton, and others, are all bringing new light to bear upon the habits of the king of fresh-water fish.

In our own profession there are many enthusiastic anglers, and a short account of the work done in the study of the periodic development of salmon scales may prove a valuable incentive to further scientific observation.

In British rivers it has been shown that generally the smolt or immature salmon remains in fresh water two years before migrating for the first time to the sea. The period which it spends in the sea before again returning to the river to spawn varies considerably. Of the shoal of smolts entering the sea, the great majority remain two or three winters, returning to the river as four-year-old fish, and varying in weight from seven to fifteen pounds or more. A small proportion remain a fourth winter, and enter the river as six-year-old maiden unspawned fish, weighing from thirty to fifty pounds.

These conclusions have been based on the scale theory, which is steadily gathering increased adherents. The work to be done requires careful observers over a wide range, and a good knowledge of photography would be a valuable asset. Broadly speaking, the salient points of the theory are as follows:—

Every salmon acquires most of its scales shortly after birth. Any further growth would be to replace lost scales. These scales increase in size as the fish ages by the addition of rings or ridges, in much the same way that the annular rings are added to the growth of a tree.

There is this difference, however, that a considerable number of rings are added each year. Malloch states that a salmon adds sixteen rings to its scale in each year of its life, as long as it feeds and grows. This generalisation is not borne out by Johnston and others, who contend that from fifteen to twenty lines are acquired during the two years in the parr and smolt stage, and from twenty to thirty additional lines during each subsequent year spent in the sea.

In winter time, when there is a scarcity of food, the parr ceases to feed, and there is consequently a cessation of growth. Hence on each scale we have a number of concentric rings round the centre of growth considerably wide apart, representing the feeding during the first summer of its life, followed by a few lines close together, indicating the slower growth as the first winter approaches. Around this is a further series of summer lines, and a second winter band. The third year of life generally shows a few additional lines, representing the feeding on the road down the river to the sea.

Once the smolt enters the sea water, rapid growth,

due to richer feeding, commences. The lines or ridges are strongly marked and placed far apart. In the winter there is again a diminished rate of growth, if not cessation altogether. This may be due to a lessened food supply, some form of hibernation, or perhaps to the development of the spawning instinct. It seems to be a general opinion that salmon when again entering fresh water to spawn cease to feed. Certainly, over a long period of experience in salmon fishing, I do not remember a single case in which fresh or partially digested food has been found in a fish. It may, of course, be the case that when a fish finds itself hooked it ejects food, much on the same principle that the tern ejects food when attacked by the skua gull.

The winter band, denoting the cessation of feeding in the sea, is marked by a series of closer lines or ridges. In the case of grilse or fish spending two winters at sea before returning to the river, the winter band is again surrounded by a further series of wide rings, showing the portion of the second summer spent in the sea.

The dark band is characteristic of all grilse fish. If, therefore, a larger fish is found to have several such bands each surrounding a full series of summer rings, the logical conclusion is that all such bands were formed in the sea, and that these large fish running up to forty pounds weight are maiden unspawned fish returning to the river for the first time.

On the return of the "kelt" fish to the sea, ravenous feeding begins, and broad well-marked ridges are developed round the old kelt scales. Between them is the scar or spawning mark, giving evidence that the fish has entered the river and spawned.

The reader may obtain more information from *Life History and Habits of the Salmon, Sea Trout, and other Fresh-water Fish*, by P. D. Malloch (A. and C. Black); *Salmon Scale Examination and its Practical Utility*, by J. A. Hutton (Sherratt and Hughes); *The Lochs and Rivers of Scotland*, by D. S. Calderwood; and the annual reports of the Scottish Fishery Board.

On one important point I would join issue with both Hutton and Calderwood. The latter holds that the "bull trout" of the Tay is really a salmon which has spawned before, and Mr. Hutton on the Wye claims that his investigations support this view. In his book Mr. Calderwood consistently refers to the "sea trout" of the western coast as synonymous with the bull trout of the Coquet. This is a view I cannot accept; and if both Mr. Hutton and Mr. Calderwood's views on "bull trout" are based on this assumption, I feel tolerably certain that they are wrong. The Coquet has been in the past, *par excellence*, the "bull-trout" river of England. In the 'seventies Frank Buckland tried by the most rigorous measures to exterminate them, and failed. In shape, position of dorsal fin, markings, and square operculum, they differ so much from the salmon that they are easily distinguished. Further, it is easy to distinguish the bull-trout grilse —I mean the fish which has spent one or two winters at sea—from the salmon grilse. It is also perhaps worthy of note that of late years the true salmon is finding its way more freely into the Coquet.

The work which is being done is stimulating, and opens out a line of investigation within the reach of most anglers.

The Fertility of Soil.

At one of the meetings of the Agricultural Section of the British Association, Dr. E. J. Russell and Dr. Hutchinson described the result of extensive investigations made by them at Rothampstead on the part played by micro-organisms other than bacteria in determining the fertility of soils. These results are probably the most important contribution made to our knowledge of soils since the discovery, fifty years ago, of the fixation of nitrogen.

The fertility of soil depends on the activity of bacteria, which act as producers of plant food. Any cause which limits their activity limits the productive power of the soil.

The investigations show that partial sterilisation by heat, or treatment with volatile antiseptics like toluene, lead to a notable increase in productiveness. Shortly after the cessation of this treatment there is a great increase in the rate of multiplication of bacteria, and therefore in the rate at which plant food is formed.

This increased activity is not due to greater vigour on the part of the bacterial stock; on the contrary, the treatment actually weakens these organisms. The effect must be chiefly to improve the environment, and make it better adapted to a vigorous propagation of bacteria at a subsequent stage. Further experiments show that the addition of an aqueous extract of the original untreated soil to the partially sterilised material results in still greater bacterial activity. This result has been directly traced to the addition of the more vigorous organisms of the untreated soil. On the other hand, the addition of the original untreated soil produced a subsequent detrimental effect. The obvious conclusion is that the original soil contains some injurious factor, not removed by water, which slowly makes its action felt when introduced into clean soil. This factor can be destroyed by any poisonous organic vapour, by heating to 52° C., and by similar means.

It seems difficult to account for such a factor in any other way than by supposing that it is of the nature of an organism, larger than bacteria, not readily detached from the soil, and capable of checking bacterial development.

Search for such an organism has revealed the presence, in every soil so far examined, of amœbæ, or kind organisms of colopoda and other protozoa. The mixed culture growing in hay has been shown capable of destroying bacteria. It has not yet been possible to ascertain definitely whether these protozoa are active in the soil; direct evidence of their injurious nature is wanting, although it would seem that the conditions are favourable to their development. Indirectly, however, there is enough evidence to warrant the assumption, as a working hypothesis, that there is present in ordinary untreated soil some large organism, capable of checking bacterial growth, and so reducing productivity.

The further development of these experiments will be awaited with interest. If some method can be found of reducing the effective power of the deleterious agent, whether it is organic or sporadic, there seems to be no reason why the fertility of soil should not be increased by a large amount in the future.

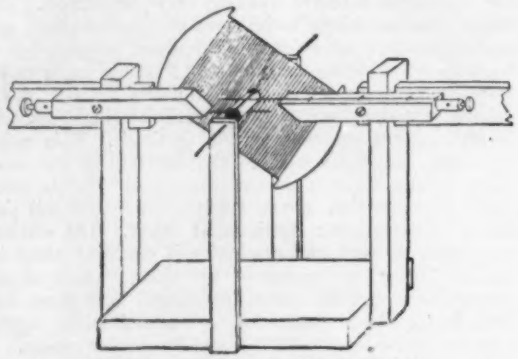
A Useful Piece of Apparatus.

In *School Science and Mathematics* Mr. H. S. Curtis describes a useful piece of apparatus for illustrating earth induction and the principle of the simple dynamo and motor.

It consists of an armature shaped as shown in the figure, about three inches long and one and a half inches wide. It is fixed to a four-inch length of steel knitting-

needle, which serves as an axle. This axle rests in two holes bored in metal uprights, so that the axle is about four inches above the base of the apparatus.

The armature is made of soft sheet-iron, and is wound with about six layers of No. 22 S.W.G. insulated copper wire, and the terminals of the wire are soldered to the two sections of a one-inch long brass tube, slit on both sides and insulated, so as to serve as a commutator. The brass tube is mounted on a cylinder of cork, through which the axle passes, the diameter of the tube being a quarter of an inch. It is bound to the cork cylinder with waxed thread. The armature and uprights are mounted on a wooden base about six inches square; and at the two sides, so that the armature may revolve between, with a clearance of about an inch, are two wooden uprights with slots cut facing the armature, so that magnets may be inserted and act as field magnets to the revolving armature.



Arrangement of Armature Parts.

On these uprights are set small wooden cross pieces pointing in towards the commutator, and carrying straight pieces of copper wire.

These are pivoted each on a single screw, so that the copper wire may be brought into contact with the commutator, and act as brushes. The outer ends of these wires lead to binding posts screwed into the outer ends of the cross pieces. The apparatus is simple, and the cost of material small.

It would probably be improved if the core of the armature were laminated.

The apparatus may be used to demonstrate simple experiments in earth induction, the principle of the dynamo, and, by connecting cells, the elementary principle of the motor. In the latter case the motor may be reversed by reversing the polarity of the field.

The Isolation of Radium.

Hitherto radium has existed in a compound state as a salt. It has generally been prepared in the form of a bromide or chloride. In a communication to the Academie des Sciences, Madame Curie announces that, working in collaboration with M. de Bierne, she has succeeded in isolating pure metallic radium.

The process employed is electrolytic, supplemented by distillation of the mercury used at a temperature of 700° C. in an atmosphere of specially prepared hydrogen.

The new metal is white in appearance. On exposure to the air it oxidises at a great rate, and becomes black. It adheres firmly to iron, burns paper, and decomposes water.

The press communication is only in the form of a brief summary of Madame Curie's report to the Academy, and detail is wanting. Apart from its use as a medical agent, the true significance of the radio-active properties lies in the fact that they have completely revolutionised the whole scientific conception of the universe, and compelled physicists to start anew with the theory of matter.

A TALE FOR THE STORY HOUR.

LIDUSHKA AND THE FROG.

A Bohemian Fairy Story.

BY MARIE BAYNE.

LIDUSHKA was a fair young girl who lived in Bohemia. Her father had a little farm, and Lidushka was his only child.

Lidushka's mother was dead; so, although this girl was only ten years of age, she had to keep house for her father.

The farmer was very proud of his little daughter. He loved to see her going about her work, looking so trim and neat; and he used to say that there was no better housewife in all Bohemia.

Lidushka was brave. Often her father had to go to market, and she was left alone; but she felt no fear. "Nothing can harm you, my child," her father would say, "so long as you keep your hands from the Water King's blossoms!"

Lidushka knew very well what her father meant. The Water King was the wicked spirit who lived beneath running brooks, and he loved to lure people into his crystal prisons. He used to disguise himself like a red water-lily, and then, when folks tried to pluck the beautiful flower, he would drag them down—down—down to his terrible home.

"Promise me never to touch the red water-lily!" said her father. And Lidushka promised.

Well, one day the farmer went off to market, and Lidushka was left alone.

"Now, what shall I do this morning?" thought she. "Shall I mend the stockings, or make the jam, or do my washing by the brook?"

Just then a sunbeam peeped through the window, as if to say to her, "Come out, Lidushka!"—and that decided her.

"I will do my washing by the brook," said she.

So she took her tub and her soap and her bundle of soiled linen, and set off to the brook.

The brook flowed through a cool, green meadow, and it was very pleasant there. Willow trees stooped down to kiss the water, tall trees and golden iris grew on the banks; and here and there, on the face of the brook, lay a bright red patch of colour. These were the scarlet lilies of the Water King.

"Come, pluck me, Lidushka!" each one seemed to whisper. But Lidushka knew better. She filled her tub with bright, clean water, and began her washing. "Rub-a-dub, rub!" she sang, and by-and-by the soap-suds began to froth and glitter in the sun.

Soon her linen was fair and white; and Lidushka spread it out on the grass to dry. As she stooped down to arrange it neatly, a speckled frog came hopping towards her from the brook.

"Go away, you nasty thing!" cried Lidushka; but the frog paid no heed to her.

With a flip and a flop, it kept on its way, until it landed right in the middle of a linen sheet. Then it stopped short, and gazed with round eyes at Lidushka.

Nothing would move the creature. Lidushka got a stick and tried to chase it away. She poked, she scolded, but all in vain. The frog refused to stir; and at length, half in fun, she cried to it, "Go home, you silly thing, and cook your dinner, for I am coming to dine with you to-night!"

To her surprise the frog seemed pleased at this news. It hopped off the sheet, leaving queer damp marks upon it; then it made for the brook, and Lidushka followed.

The frog leaped into the water, spread out its legs, and began to swim. Lidushka wondered where it lived. She ran by the bank to see, and all at once, just where the brook turned round a corner, she saw the frog vanish beneath a stone.

Then Lidushka went home, and of course she quickly forgot all about it. But that evening, when she went to the meadow to gather in her washing, lo! the speckled frog again sat on her linen sheet.

This time it had found a voice. "Come along, Lidushka!" it croaked; "to-night you have given your promise to dine with me."

So what could Lidushka do but go?

The speckled frog flopped into the water, spread out its legs, and began to swim; and Lidushka ran by the bank, keeping the frog in sight, till they came to the bend in the brook.

"This way!" said the frog, vanishing beneath the stone; and before Lidushka knew what had happened, she found herself wading right into the middle of the brook.

"Lift the stone!" came the frog's voice very faintly.

Lidushka did so; and, lo! beneath it she saw a flight of stairs leading down under the brook.

These stairs were very wonderful. They were neither of wood nor stone, but seemed to be made of purest crystal. They looked exactly like layers of water, and each step shone and glistened with rainbow colours.

Lidushka went timidly down a few steps, and then she caught sight of the frog hopping gaily on before her.

"This way, my dear!" said the frog, who seemed in high spirits; and soon they arrived in the frog's house, which was built, like the stairs, of crystal water, and shone most dazzlingly.

The frog was very kind to Lidushka. First she took her to see her children; she had dozens of them, of all sorts and sizes. Some were mere specks, with no shape at all; some had eyes, some had tails, some had a leg or two, and some were almost full grown, and had legs and tails and speckled green backs like their mother.

After seeing the nursery, Lidushka and the speckled frog had dinner together. There were many courses; but every course was fish, either baked or boiled. Lidushka had never seen so many fish in her life.

"Now, my dear love," said the frog, when dinner was over, "you shall look round the house while I put my babies to bed."

Lidushka was pleased to do this, for the crystal mansion was very beautiful. She wandered from room to room, and at length she came to one which looked like a pantry. There were crystal shelves round the walls, and on these shelves stood rows of tiny jars.

Lidushka noticed that each jar was turned upside down upon the shelf. She wondered why this was, and lifted one up to see.

In a moment a white dove flew from under it, fluttered its wings joyfully, and disappeared.

Lidushka raised a second jar, and another white dove flew out; she raised a third, and a fourth—it was just the same.

"Oh, you poor prisoners!" cried Lidushka, "who has been so cruel as to treat you thus?"

So saying, she raised the jars one by one, till hundreds of doves were set free.

Scarcely had she finished her task when she heard a most dismal croak behind her. The speckled frog had discovered what she was about.

"Unhappy child!" said the speckled frog, "why did you meddle with the jars? I am the wife of the Water King, and these doves were the souls of his prisoners. Now I hear him coming! In a moment you, too, shall be imprisoned in a jar."

When Lidushka heard this her face turned pale with fright.

"Why did you ask me to come and see you?" she wailed.

"Because I was lonely, Lidushka," answered the frog; and her great eyes looked sad. "But I did not mean to do you harm," she added.

Just then there was another croak; it sounded nearer than before.

"Oh, what shall I do? Where shall I go?" cried Lidushka.

"Run—run upstairs!" said the Water King's wife. "Quick! Yonder he comes."

Lidushka heard a most terrible croak, yet she could see no one. Only up above, on the surface of the water, she saw a few buds of the red water-lily floating towards her.

Then she remembered her father's warning. In a frenzy of fear she dashed up the crystal stairs, and, looking neither to right nor left, waded across the brook.

Not till she was safe on dry land did she venture to glance behind her, and then she saw no trace of the fairy stairs.

There was the brook gurgling peacefully by, with the red water-lily on its breast.

"Come, pluck me, Lidushka," it seemed to say. But Lidushka knew better. Had she not dined with the frog in the Water King's palace?

THE NEWER LONDON.

KINGSWAY will soon be one of the show places of the Metropolis—a street of handsome buildings, and a thoroughfare so wide that you will wonder if you are in a new London. And so you are, for here a new business centre has sprung up where modern business men can cope with the demands of business in modern business buildings. Many hundreds of our readers know that the new thoroughfare contains the handsome headquarters of the International Correspondence School, and as we write another new structure is rapidly nearing completion. It is to be the London home of the "Koh-i-noor" Pencil and Waterman's Ideal Fountain Pen—two products whose fame is only bounded by civilisation itself. The building is appropriately named "Koh-i-noor House," and its erection has been necessitated by the constant expansion of trade in the goods mentioned. The work has been carried out by Mr. James Carmichael of Wandsworth, from the design of Messrs. J. S. Gibson, Skipworth, and Gordon, architects, of 5 Old Bond Street, W.; the carving is by Mr. Gilbert Searle. Messrs. L. and C. Hardtmuth, the world-renowned pencil manufacturers, are to be congratulated upon having secured such an excellent site, and on the palatial building soon to be occupied by their staff.

The British Association and Open-Air Studies.

AT the British Association meeting at Sheffield a whole morning was devoted by the Educational Science Section to an interesting symposium on open-air studies in schools of normal type. Contrary to what was happening in several other sections of this distinguished gathering, the meeting was thoroughly and heartily in agreement with the views expressed by the large number of speakers who took part in the debate. The meeting having been held in Sheffield, it will not be out of place to mention briefly what is being done there in this connection. The Sheffield Education Committee have established an open-air school at Whiteley Wood for children who are not less than ten years of age, suffering from anæmia, tuberculous glands, or general debility. Three experienced teachers have been appointed for the classes, and some assistance is also given when required by the school nurses. Every care is taken in regard to the physical well-being of the children, who are supplied with meals and bathed at the school. The parents are asked to contribute towards the cost of the food provided. The weighing and periodical examination of the children are carried out by the school medical officer, and marked improvement has been noted in the condition of every child. An interesting report on the physical results has been issued by the school medical officer. Owing to the distance of the school from the centre of the city, it has been necessary to arrange for the conveyance of the children, and the Sheffield Tramways Committee have provided gratuitously a special car to carry them to a certain spot in the morning, whence they are conveyed by wagonette to the school, the return being made on foot to another tramway stopping-place in the evening.

So much for the bare facts relating to the Sheffield experiment, but a danger arises of outdoor educational work being mentally associated with, and practically restricted to, the physically defective; and, be it noted, one at least of those closely concerned with Sheffield education approves this course. Of course, anxiety with respect to the physique of school children has led to the multiplication of open-air recovery schools, the value of which, from the hygienic standpoint, is beyond question; whilst their work on the educational side is by no means unsatisfactory. It is a moot point whether civilisation, so called, is not the means of our developing into the very antithesis of our ancestors, who refused to dwell indoors. The average person nowadays appears to refuse to live out of doors. At present teachers are largely slaves of the schoolroom and the desk. It was urged, and rightly so, that an immediate and large increase in the amount of school work in the open air would not only benefit children and teachers generally, but, on educational grounds, would be very desirable for all classes in schools of every type.

Examine for a moment the present position. Outdoor work is restricted to drill and gardening, with, in some few schools, an occasional walk or excursion. Things which cannot be done at a desk or in a room are looked upon with suspicion as not being the real work of a school. Yet all are aware of the serious harm done to growing children by desks necessarily unsuitable, and of the impossibility of providing well-ventilated rooms and sufficient floor space. In many districts school accommodation is deficient in nearly all hygienic requisites, and aggravates the harmful influences present in many cottage homes. At the same time, the advantages of open-air work are not mainly hygienic but educational. It is impossible in the classroom to use as we ought the child's natural love of movement and his instinctive restlessness. Outside, this characteristic natural activity may be used, and the evils of wrong desk-posture and vitiated atmosphere avoided. Light, sound, heat, evaporation, and so on are all primarily outdoor subjects, and why should a lantern be used for a study of shadows? It has been demonstrated that elementary geometry, for instance, can be most effectively taught and studied out of doors.

An example may be given from actual practice. Builders' scaffold poles are placed on the ground a certain distance apart, representing a river, and by applying the isosceles right-angled triangle the students are able to determine the width. In this connection a growing tree can be made use of. There may be, and no doubt are, difficulties of organisation connected with school journeys where the only suitable spots are some distance away. But instances are not wanting where ingenuity has overcome these to a limited extent: in other words, if the children cannot be taken to the gardens, the gardens can be brought to the children. The provision of school gardens would enormously widen the possibilities of work in the open air in immediate proximity to the school. But putting gardens on one side for the moment, the adoption of the asphalted playground offers facilities which should be taken advantage of to a much greater extent than is the actual case now. It may be remembered that this was recently urged upon rural teachers by the President of the Board of Education. The larger available space even in a playground makes co-operative work possible in working out lessons in arithmetic, mensuration, and geometry on the playground floor.

The adoption of outdoor methods in relation to Nature study, and the abolition of that anomaly "blackboard Nature study," was strongly urged before the British Association—the irony of confining children indoors to study snow, rain, wind, dew, sunshine, and plant life being obvious. Objections have been raised to technical education in horticulture as a school subject; but without attempting to dogmatise, there was a general consensus of opinion that there is a crying need for the multiplication of school gardens, not necessarily for such instruction, but for the conduct of real Nature study. The garden should not merely provide the material for, but should be the scene of the lessons, where the scholars may carry on prolonged investigations, for instance, into growth. England's backwardness in the provision of school gardens was the subject of much comment. Mr. J. Eaton Feasey, who opened the discussion on this subject, expressed the opinion that it is not impossible to meet the difficulty of providing gardens even in the congested parts of cities. Plots of land might be laid out in the suburbs, and classes conveyed to these garden schools for half a day each week for outdoor work of various kinds. No plans should be passed for new suburban or rural schools unless a garden is provided; and H.M. inspectors were urged to emphasise the importance of making playgrounds and gardens the scene of lessons. Before leaving the subject of school gardens, it may be mentioned that one experimenter has found about sixty

feet by twenty-seven feet, with a central path of four feet, to be a suitable area for two boys, one above twelve and the other under. When girls are at sewing the boys should be sent gardening.

Difficulties of organisation have been referred to, and these are for the most part of local character. That they can be overcome is shown by the following account, given by another speaker, of the four kinds of school journey attempted at the Kentish Town Road (London) School. Each class spends one half-day on Hampstead Heath (one mile away). The time-table shows drawing, geography, drill, Nature study. If wet, these subjects are taken at school; if fine, drawing is combined with geography, or Nature study occupies the whole afternoon. Typical work includes tree study; scenery study, such as hills, rivers, valleys, rocks, etc.; map-making and reading; contours; plant œcology; pond life; clouds; snow and atmospheric effects; "colonisation;" and seeking hidden treasure. On Saturdays rambles are taken to Epping Forest for toadstools, Richmond Park for pond life, and Charlton Quarry for rocks and fossils. A week's visit is paid to some distant centre, such as Chepstow, Abergavenny, Shanklin, the Cotswolds, or Folkestone (with day trip to Boulogne). The cost, from eighteen shillings to twenty-one shillings per head, is borne chiefly by the parents. From forty to fifty boys, aged from seven to fourteen years, are taken. They have always been taken in the Easter holiday; and the ideal party is regarded as made up of three teachers, an organiser, treasurer, and house-master, with thirty or forty boys. Finally, in July, the whole of the top class of this particular school (thirty-five boys) spent four days with their masters at a "retreat" in Epping Forest, at a cost of six shillings per head. School lessons were followed in the forest, according to the time-table, in the mornings, a journey being taken in the afternoon.

The symposium included some account of a training college under canvas, which has been a feature of Armstrong College, Newcastle-on-Tyne, for the past seven years. Large parties of schoolboys are taken to camp, where study and practice in teaching are combined. Any one who has been sturdy enough to stand sleeping under canvas will confirm the physical advantages which accrue; the Newcastle experiment showed, in addition, that the teaching became more alert and human than in the conventional surroundings of the schoolroom.

This discussion brought to light the fact that great as the need undoubtedly is for reform in relation to open-air teaching, much is being done which is not within the knowledge of the public, and in no case can any measure of failure be detected. There is every inducement for the powers that be to assist leaders of educational thought in putting their ideas into practice on a much larger scale than has been the case hitherto. Finance and organisation are the chief stumbling-blocks, but neither should be allowed to remain an insuperable difficulty in a question of such far-reaching and national importance.

Education and National Strength.*

NEVER before was there so much talk about education as now—not even in the days when *Émile* had just appeared, and every one with pretension to culture or intelligence had his ideas about Rousseau's teaching. Never, we believe, was there a greater desire to get behind words and forms and traditions and dogmas to the central truth about education, to see what it can do and what it cannot; to find out the special needs of this generation, and to try to provide for them. Among many voices, diverse and conflicting, one is very audible: "Give us strength; give us the education which will help us to gain and keep it." How is that desire to be satisfied? Wealth, extent of territory, number of colonies, large population with rapid growth, advancing exports and imports, size and efficiency of armies and fleets—these may be elements in national strength. Technical and professional education may do much for a community. But we are all more or less conscious that other things underlie these, and that the best which we have may not endure unless they rest upon a national education wisely conceived—above all, one which helps to form strong men and women. In the main, what is needed is the forming and strengthening of character; the ensuring that there is something stable upon which life may be built; training the intellect to see things as they are, the will to be active and strong, the emotions to be subject to control. One guide we have; one perfect instructor most of us have known. For the infant we are all agreed that a sensible and loving mother is not only the best instructor within reach; she is ideally the best—the one that, according to the true conception of education, can draw out all that is of promise within, and shape the character as it ought to be shaped; and in thousands of families something little short of that ideal is realised. The right path is lost when the child passes into other hands.

If born among the poor, he is too often thrust into a life of toil just when there should be repose and opportunities of silent growth; and so he misses the irrecoverable treasure of a happy childhood. If he is born in the well-to-do middle classes, and is capable, he is too often pushed by scheming, ambitious parents and headmasters into a narrow groove: they train him to be a mighty "pot-hunter," a universal prize-winner, with the result, perhaps, that he becomes dead to the love of knowledge for itself, and loses aptitude for meditative or creative thought. He is not taught to act with courage and promptitude, to see things as they are, to be dominant over words and phrases. He must be morbidly receptive, and quick and dexterous in reproducing what has been stuffed into him. He is trained not into strength, but into weakness. Here and there—and of late much more often than before—a schoolmaster breaks wholly with the system of rearing examination prodigies. It is unfortunate that he sometimes falls into another error and stimulates morbid self-consciousness. The fine flower of life, the true elements of national strength, are as little to be found in the prig or introspective dullard as in the muscular pagan or the hero of scores of examinations. That community will be strong in which there are many persons who can truly say, "I am the master of my fate, I am the captain of my soul," with wills trained to strenuousness and constancy.

* With acknowledgments to the *Times*.

OUR PHOTOGRAPHIC PAGE.

THE CAMERA, AND HOW TO CHOOSE IT.

BY THOMAS A. BRIGGS.

WE have all, at one time or another, wished that the pretty scene or the amusing incident could be portrayed on paper, to be enjoyed again in days to come. The pen does not give an adequate idea of the thing seen. The verbal description may be lame and incomplete; but the camera crystallises the moment for us, and keeps our memories ever bright and fresh.

But, on the other hand, you may have thought that the after part of picture-making was a messy and intricate business. This was so in days gone by; but, thanks to the ingenuity of manufacturers in simplifying details, the hobby is now a pleasure instead of a toil.

In this chapter I propose to describe briefly the various cameras in use at the present time. Reduced to its lowest terms, the camera is simply a dark box, with a lens at one end and a sensitive plate at the other; all the other parts are added for greater convenience or efficiency.

There are two general types of camera—the box, or, as it is commonly called, the "hand" camera; and the folding camera.

I will describe the box camera, as arranged for plates, first. It usually carries twelve plates, and the great advantage of this form is its ever-readiness, for you have only to point it at the object and press a lever; that is all. But it is this very facility which is often so fatal to good work; we are inclined to snap any and every thing. The plates are carried in the back of the camera—the magazine—and as they are exposed a knob is pressed which allows the last exposed plate to fall face downwards into a well at the bottom of the camera. The plates are carried in sheaths of thin metal; these are really metal backings to the plates. Care should be taken to see that the plate-dropping arrangement is working properly, as there is nothing so annoying as to find two or three exposures on a plate which has not dropped in its turn.

The shutter covers the plate, except at the moment of exposure, when it can give either a "time" or "instantaneous" exposure. The latter should have several speeds, not for different speeds of objects, but to enable a slower speed of exposure on a dull day, thus giving a fuller light effect on the plate.

There is also an iris diaphragm, or "stop," of the lens. This is an ingenious arrangement, by which the hole in the plate between the lenses may be altered in size. I shall hope to explain its uses in a later chapter.

At the front of the camera there are two finders, which give the view as seen by the plate—only, of course, in miniature. One is for vertical pictures, and the other when the camera is used horizontally.

The folding camera is also very popular at the present time, as it is so convenient to carry about. This is a point of great importance, for an instrument which is portable and not bulky is more likely to travel further and take more pictures.

The folding camera, which is something like a stand camera very much condensed, has a folding baseboard, which falls down when opened, making a right angle with the back of the camera. The front, carrying the lens and shutter, is then pulled along the base to a certain mark or stop, when the camera is ready for use. In some models the front is self-erecting, but the machine is thereby limited in other directions. The lens and shutter are the same as described for the box camera; but the finder is usually a single one, which swivels over on a hinge for vertical and horizontal pictures. Either film or plate cameras of the folding type may be obtained. Some makes take both; and this is a great convenience, for on a holiday you may use films exclusively, thus doing away with the need of a dark room; while at ordinary times you may use plates, and so save a considerable amount in cost of materials. (Roll films are three times the cost of plates.) In the plate type of camera the plates are carried in light double holders. These are very convenient for slipping into the pocket; also the camera itself can generally be slipped into an inside pocket. The greatest advantage of the folding camera, after its portability, is the fact that you may focus the view on a focussing screen in a similar manner to a field or stand camera. This enables you to see the picture full size on the screen before using a plate. Many a plate may thus be saved when some glaring defect makes itself apparent on the screen first. A folding camera is always fitted with screw holes for use on a tripod. Box cameras are so fitted, but are rarely used on a stand.

Now you may think that to produce good pictures an expensive tool is necessary. This is by no means the case, for with care and a little practice—that necessary article in the pursuit of all hobbies—very good pictures may be taken with a camera costing as little as five shillings. These little instruments have their limitations, of course, and success, I think, consists in knowing what they will not do—and not doing it. I have seen excellent pictures taken with a five-shilling "Brownie." This is a little box camera which takes films (the pictures are $2\frac{1}{4}''$ square), and it is a very useful little tool for a beginner. Then there are the larger ones in this series at ten shillings and seventeen shillings and sixpence, and a neat little folding type at a guinea. A very good box camera for plates at twenty-five shillings is the "Klito," which has a focussing arrangement. Another box camera is the No. 0 "Midg," which is one guinea. Then there is the folding "Cameo" at twenty-five shillings, and the folding "Klito" at thirty shillings. These I have mentioned are only a few amongst the number actually made, but the above prices serve to show that expense need be no deterrent to the beginner. I should not advise any other size than the quarter plate ($4\frac{1}{4}''$ by $3\frac{1}{4}''$) to begin with, for plates can be obtained almost anywhere, and the cost of plates and paper is kept low, while the picture is not impossibly small; it is a useful album size.

To sum up, I will give the advantages of the two types in parallel columns, so that you may decide on the kind which would suit you best.

The Box Camera.	*The Folding Camera.*
Strongly made.	Light in weight.
Ever ready.	Very portable.
Carries twelve plates.	Picture can be focussed.
Simple to use.	Can be used either as hand or stand camera.
Generally unobtrusive in work.	

NOTICE.

A PHOTOGRAPHIC PAGE suitable for beginners will be given every month.

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2. Competitors should cut out and send the *coupon* which appears on the Back Wrapper page of the current number. One coupon must be sent for each entry.
3. Competitors should write pseudonym only on MS. Prize-winner will be asked to send name and address for publication.
4. No competitor may take the prize offered more than once in three months.

A Prize of **Half a Guinea** is offered for the best rendering into English of the following extract:—

Une haine immense s'éleva contre les destructeurs de l'antiquité, les brûleurs, gratteurs de manuscrits. L'auto-da-fé d'un million de volumes, qui se fit à Grenade après la conquête, parut un vaste crime contre la raison, contre Dieu. Le cardinal Ximènes, imprimant la Bible en cinq langues, expia-t-il par là les quatre-vingt mille manuscrits qu'il avait brûlés de sa main? Chaque fois qu'on découvrait sous quelque antienne insipide un mot des grands auteurs perdus, on maudissait cent fois ce crime, ce vol fait au genre humain, cette diminution irréparable de son patrimoine. Souvent, la ligne commencée mettait sur la voie d'une découverte, d'une idée qui semblait féconde; on croyait saisir de profil la fuyante nymphe, on y attachait les yeux, à cette trace évanouie, jusqu'à l'éblouissement et la défaillance. En vain; l'objet désiré rentrait obstinément dans l'ombre, l'Eurydice ressuscitée retombait au sombre royaume et s'y perdait pour toujours. On a dit, non sans vraisemblance, que les statues antiques qui sont arrivées jusqu'à nous, statues de marbre, sont les moindres. Les ouvrages capitaux de Phidias, de Praxitèle, furent faits d'or, d'argent, d'ivoire, et ils ont péri. Il en est peut-être de même des manuscrits anciens. Où sont les œuvres politiques, célèbres dans l'antiquité? Et Carthage, et la Syrie, parentes immédiates du monde juif, comment n'en reste-t-il rien? Là eût été le véritable éclaircissement du peuple biblique, dont les livres, tellement isolés dans la ruine générale des nations sémitiques, restent aussi peu accessibles qu'une arche d'un pont rompu au milieu d'un fleuve. Les deux bouts en furent emportés; ni de l'un ni de l'autre bord vous ne pouvez y arriver; ruine d'autant plus grandiose, mystérieuse, qu'on n'en approche plus. Qui sait si, dans ce million de livres orientaux que brûlèrent les Espagnols, il ne restait pas quelque chose des hautes antiquités de la Syrie, de l'Arabie, d'Ismaël, frère d'Israël.

From "La Renaissance," by J. MICHELET.

RESULT OF THE SEPTEMBER COMPETITION.

The prize is awarded to "Traducteur." (Will "Traducteur" kindly forward name and address for publication?)

First Class.—Dorine, Meadow Sweet, Southchurch, 1812, Comet, Tim, Leicester, Uebersetzer, Hialmar, Mergy, L. N. R., Dot, Colline des alouettes, La Corrèze, Maboul, Elsie, Hiawatha, Manon, Gaud, Kettering, Lonely, Lucille, Jane, Clapham, Ferney, Hinton, Vaurien, Pernagie, Acer, W. M. E., Thruma, Dum spiro spero, Virginie, Oslo, M. F. W., Jean Valjean, A. B. C., Student Teacher, Espérance, Siwel, Angleterre, Marie, Michael.

Second Class.—Langton, Carmel, Rusticus, Fidelis, Turquoise, Bee, Xenophon, Eillen, Elba, Essex, Le Nève, Leander, Lily, Duo, Irish Colleen, Anrol, Bellis perennis.

REPORT.

It has not been possible this time to find a rendering quite free from errors in translation. We consider that of "Traducteur" the best, although there are one or two small errors in translation, and "the proud delight of all one's life being able to say" is certainly not elegant. A large number translated *théâtre* as "theatre," and not as "stage," and not a few preserved in their translations the French idiom in *croyions marcher* and *croirait respirer*. Too many still translate *on* every time as "they," and there are several who use the dreadful word "that" instead of "who" or "whom." No less than four competitors translated *pères* as "forefathers," and one as "ancestors," quite oblivious of the fact that they were resuscitating bygone generations to join in the enthusiastic welcome which would be accorded to the troops returning from Moscow. One candidate humorously translated *on accourrait sur notre passage* as "they would hasten up our lane." We do not know why "Rusticus" sent in two papers. We have mentioned this before, and trust there will be no further repetition of a practice which is troublesome to the Editor and of no benefit to the candidate.

PRIZE TRANSLATION.

At sight of this gilded city, this glorious link between Asia and Europe, this imposing capital in which were to be met side by side the luxuries, the customs, and the arts of the two finest continents, we came to a halt, for our minds were filled with thoughts of proud delight. What a glorious day this was! It would for ever be engraved on our memories as marking the greatest and most magnificent event of our lives. We felt that the eyes of an astonished universe were about to be fixed on our every action, and that our slightest movements would become historic. We were marching, as it were, on a huge and magnificent stage, towards which were directed the attention and the applause of every nation. We anticipated the gratitude of our age, which we proudly imagined ourselves to have raised above all other ages. Already we pictured it great with our greatness and radiant with our glory. On our long-looked-for return, with what considerate and almost respectful attentions, and with what enthusiasm, should we be received by our wives, our fellow-countrymen, and even our fathers. For the rest of our lives we should be regarded as superior beings, at whom they would gaze with wondering eyes, and to whose stories they would listen with eager admiration. People would gather merely to see us pass, and our lightest words would be carefully recorded. This miraculous conquest encircled us with a halo of glory; henceforth we should be looked upon as surrounded by an atmosphere of prodigies and wonders. And when these vainglorious thoughts gave place to more moderate feelings, we said to ourselves that this was the promised end of all our labours; that at last we were going to stop, since we could never surpass the record of such a glorious expedition—a worthy rival of the Egyptian campaign and of all the great and glorious wars of antiquity. At this moment perils, sufferings, all were forgotten. Was any price too high to pay for the proud delight of all one's life being able to say, "I fought at Moscow"? "TRADUCTEUR."

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1. Each correspondent is restricted to *one* question.
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3. CORRESPONDENTS MUST IN ALL CASES STATE THE SOURCE FROM WHICH THEIR QUERY HAS BEEN OBTAINED.

The Editor reserves to himself the right to decline to answer any question which is, in his judgment, unsuited to the Magazine.

François.—If A, B, C are the angles of a plane triangle, show that

$$\begin{vmatrix} -1 & \cos C & \cos B \\ \cos C & -1 & \cos A \\ \cos B & \cos A & -1 \end{vmatrix} = 0,$$

and, by expanding the determinant, deduce that

$$1 - \cos^2 A - \cos^2 B - \cos^2 C - 2\cos A \cos B \cos C = 0.$$

Further, if

$$\begin{vmatrix} 1 & \cos x & 0 & 0 \\ \cos x & 1 & \cos\alpha & \cos\beta \\ 0 & \cos\alpha & 1 & \cos y \\ 0 & \cos\beta & \cos y & 1 \end{vmatrix} = 0,$$

show that $\sin^2 x \sin^2 y = \cos^2\alpha + \cos^2\beta - 2\cos\alpha\cos\beta\cos y$.

(Honours, Board of Education, 1908.)

In any triangle we have

$$a = b\cos C + c\cos B,$$
$$b = c\cos A + a\cos C,$$
$$c = a\cos B + b\cos A.$$

Or,

$$-a + b\cos C + c\cos B = 0,$$
$$a\cos C - b + c\cos A = 0,$$
$$a\cos B + b\cos A - c = 0.$$

Eliminating a, b, and c, we get

$$\begin{vmatrix} -1 & \cos C & \cos B \\ \cos C & -1 & \cos A \\ \cos B & \cos A & -1 \end{vmatrix} = 0.$$

Hence

$$-1\begin{vmatrix} -1 & \cos A \\ \cos A & -1 \end{vmatrix} - \cos C\begin{vmatrix} \cos C & \cos A \\ \cos B & -1 \end{vmatrix} + \cos B\begin{vmatrix} \cos C & -1 \\ \cos B & \cos A \end{vmatrix} = 0;$$

that is, $-1 + \cos^2 A + \cos^2 C + \cos A\cos B\cos C + \cos A\cos B\cos C + \cos^2 B = 0$;

or, $1 - \cos^2 A - \cos^2 B - \cos^2 C - 2\cos A\cos B\cos C = 0$.

Again, since

$$\begin{vmatrix} 1 & \cos x & 0 & 0 \\ \cos x & 1 & \cos\alpha & \cos\beta \\ 0 & \cos\alpha & 1 & \cos y \\ 0 & \cos\beta & \cos y & 1 \end{vmatrix} = 0,$$

we have

$$\begin{vmatrix} 1 & \cos\alpha & \cos\beta \\ \cos\alpha & 1 & \cos y \\ \cos\beta & \cos y & 1 \end{vmatrix} - \cos x\begin{vmatrix} \cos x & \cos\alpha & \cos\beta \\ 0 & 1 & \cos y \\ 0 & \cos y & 1 \end{vmatrix} = 0;$$

that is,

$$\begin{vmatrix} 1 & \cos y \\ \cos y & 1 \end{vmatrix} - \cos\alpha\begin{vmatrix} \cos\alpha & \cos y \\ \cos\beta & 1 \end{vmatrix} + \cos\beta\begin{vmatrix} \cos\alpha & 1 \\ \cos\beta & \cos y \end{vmatrix} - \cos^2 x\begin{vmatrix} 1 & \cos y \\ \cos y & 1 \end{vmatrix} = 0;$$

that is, $1 - \cos^2 y - \cos^2\alpha + \cos\alpha\cos\beta\cos y + \cos\alpha\cos\beta\cos y - \cos^2\beta - \cos^2 x + \cos^2 x\cos^2 y = 0$;

that is, $\sin^2 y - \cos^2\alpha + 2\cos\alpha\cos\beta\cos y - \cos^2\beta - \cos^2 x\sin^2 y = 0$;

that is, $\sin^2 y\sin^2 x = \cos^2\alpha + \cos^2\beta - 2\cos\alpha\cos\beta\cos y$.

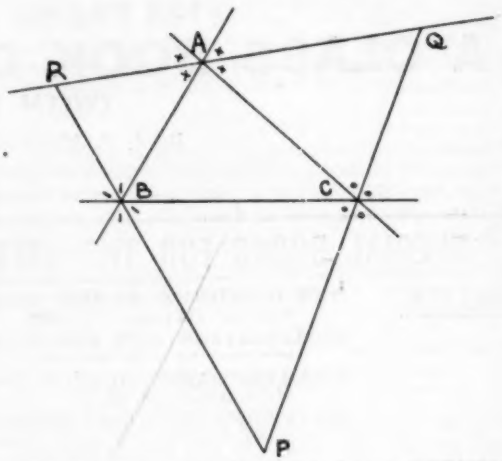
Florence Smith.—A triangle PQR is formed by joining the centres of the escribed circles of the triangle ABC; a second triangle $P_1Q_1R_1$ is then formed by joining the centres of the escribed circles of PQR; a third triangle is formed by joining the centres of the escribed circles of $P_1Q_1R_1$, and so on continually. Show that ultimately the last of these triangles is equilateral. (Honours, Board of Education, 1910.)

In the triangle PBC we have

$$P + 90 - \frac{B}{2} + 90 - \frac{C}{2} = 180,$$

hence

$$P = \frac{B+C}{2} = 90 - \frac{A}{2}.$$



In the same way, representing the angles of the triangles by the letter at the vertex,

$$P_1 = 90 - \frac{P}{2} = 90 - \frac{90}{2} + \frac{A}{2^2},$$

so

$$P_2 = 90 - \frac{P_1}{2} = 90 - \frac{90}{2} + \frac{90}{2^2} - \frac{A}{2^3},$$

and so on until

$$P_n = \left(1 - \frac{1}{2} + \frac{1}{2^2} - \frac{1}{2^3} \ldots \overline{n+1} \text{ terms}\right) . 90 - \frac{A}{2^{n+1}};$$

and when n is infinitely large

$$P_n = \frac{1}{1+\frac{1}{2}} . 90 = \frac{2}{3} . 90 = 60°,$$

since $\frac{A}{2^{n+1}}$ is ultimately zero.

Similarly Q_n and R_n are ultimately 60°.

Colton.—Prove that

$$(x + \sqrt{1+x^2})^n = 1 + nx + \frac{n^2x^2}{\underline{|2}} + \frac{n(n^2-1^2)}{\underline{|3}} . x^3 + \frac{n^2(n^2-2^2)}{\underline{|4}}x^4 + \frac{n(n^2-1^2)(n^2-3^2)}{\underline{|5}}x^5 + \ldots$$

and *deduce* the expansion of

$$\log(x + \sqrt{1+x^2}); \quad \frac{1}{\underline{|2}}\{\log(x+\sqrt{1+x^2})\}^2; \quad \frac{1}{\underline{|3}}\{\log(x+\sqrt{1+x^2})\}^3.$$

(Edwards's *Differential Calculus*.)

Let

$$y \equiv (x + \sqrt{1+x^2})^n = a_0 + a_1\frac{x}{\underline{|1}} + a_2\frac{x^2}{\underline{|2}} + a_3\frac{x^3}{\underline{|3}} + \ldots + a_n\frac{x^n}{\underline{|n}} + \ldots$$

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then, by MacLaurin's Theorem,

a_n = the value of $\frac{d^n y}{dx^n}$ when x is zero.

Since $y = (x + \sqrt{1+x^2})^n$,

$$\frac{dy}{dx} = y_1 = n(x + \sqrt{1+x^2})^{n-1} \cdot \left\{1 + \frac{x}{\sqrt{x^2+1}}\right\}$$

$$= \frac{n(x + \sqrt{1+x^2})^n}{\sqrt{x^2+1}};$$

that is, $\sqrt{x^2+1} \cdot y_1 = ny$.

Hence $$\sqrt{x^2+1} \cdot y_2 + \frac{x}{\sqrt{x^2+1}} \cdot y_1 = ny_1;$$

thus $$(x^2+1)y_2 + xy_1 = ny_1\sqrt{x^2+1} = n^2y,$$

or, $$(x^2+1)y_2 + xy_1 - n^2y = 0.$$

Leibnitz this equation, then

$$(x^2+1)y_{m+2} + m \cdot 2x \cdot y_{m+1} + m(m-1) \cdot y_m + xy_{m+1} + m \cdot y_m - n^2y_m = 0,$$

or, $$(x^2+1)y_{m+2} + (2m+1)xy_{m+1} + (m^2 - n^2)y_m = 0.$$

Put zero for x, then

$$a_{m+2} = (n^2 - m^2)a_m. \quad \ldots\ldots\ldots \quad \text{(i)}$$

Now when x is zero, $y = 1$, $y_1 = n$;

that is, $a_0 = 1$, $a_1 = n$.

Hence from (i),

$$a_2 = n^2 \cdot a_0 = n^2,$$
$$a_3 = (n^2 - 1^2)a_1 = n(n^2 - 1^2),$$
$$a_4 = (n^2 - 2^2)a_2 = n^2(n^2 - 2^2), \text{ etc.};$$

that is, $$(x + \sqrt{1+x^2})^n = 1 + nx + n^2\frac{x^2}{\underline{2}} + n(n^2-1^2)\cdot\frac{x^3}{\underline{3}} + n^2(n^2-2^2)\cdot\frac{x^4}{\underline{4}} + \ldots$$

Now let $z = \log(x + \sqrt{1+x^2})$,

then $x + \sqrt{1+x^2} = e^z$,

and $(x + \sqrt{1+x^2})^n = e^{nz}$.

Hence $$(x + \sqrt{1+x^2})^n = 1 + nz + \frac{n^2z^2}{\underline{2}} + \frac{n^3z^3}{\underline{3}} + \ldots$$

$$= 1 + n\log(x + \sqrt{1+x^2}) + n^2 \cdot \frac{1}{\underline{2}}\{\log(x + \sqrt{x^2+1})\}^2 + n^3 \cdot \frac{1}{\underline{3}}\{\log(x + \sqrt{x^2+1})\}^3 + \ldots$$

Therefore

$$\log(x + \sqrt{1+x^2}),\ \frac{1}{\underline{2}}\{\log(x + \sqrt{x^2+1})\}^2,\ \frac{1}{\underline{3}}\{\log(x + \sqrt{x^2+1})\}^3$$

are the coefficients of n, n^2, and n^3 in the expansion of $(x + \sqrt{1+x^2})^n$.

Thus

$$\log(x + \sqrt{1+x^2}) = x - \frac{1^2 \cdot x^3}{\underline{3}} + \frac{1^2 \cdot 3^2}{\underline{5}}x^5 - \frac{1^2 \cdot 3^2 \cdot 5^2}{\underline{7}} \cdot x^7 + \ldots$$

$$\frac{1}{\underline{2}}\{\log(x + \sqrt{1+x^2})\}^2 = \frac{x^2}{\underline{2}} - \frac{2^2}{\underline{4}} \cdot x^4 + \frac{2^2 \cdot 4^2}{\underline{6}}x^6 - \ldots$$

and

$$\frac{1}{\underline{3}}\{\log(x + \sqrt{1+x^2})\}^3 = \frac{x^3}{\underline{3}} - \frac{(1^2+3^2)}{\underline{5}} \cdot x^5 + \frac{1^2 \cdot 3^2 + 3^2 \cdot 5^2 + 5^2 \cdot 1^2}{\underline{7}}x^7 - \ldots$$

$$= \frac{x^3}{\underline{3}} - \frac{10x^5}{\underline{5}} + \frac{259x^7}{\underline{0}} - \ldots$$

D'Arcy.—Draw the parabola which touches four sides of a regular pentagon inscribed in a circle of 2-inch radius.

Method i.—The circum-circle of any triangle which circumscribes a parabola passes through the focus. Draw the circum-circles of the triangles formed by two sets of three tangents PQ, QR, RS; QR, RS, ST. These meet at the focus.

From the focus draw perpendiculars to the given tangents. The feet of these perpendiculars (Y, Y') lie on the tangent at the vertex of the parabola.

We now have the focus and the tangent at the vertex. Draw a line parallel to the tangent at the vertex and twice its distance from the focus. This is the directrix, and the parabola can now be drawn in the usual way.

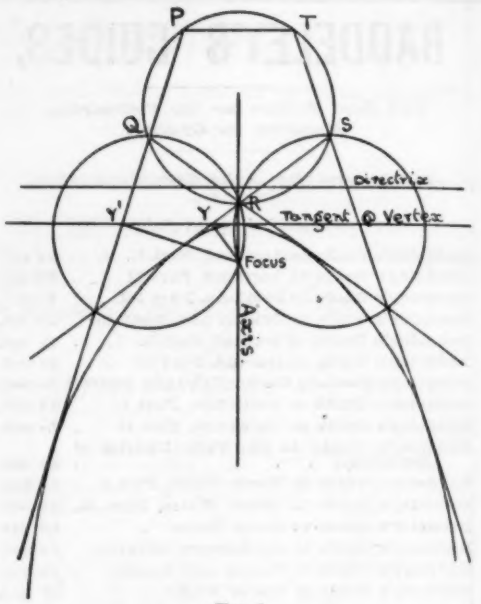

FIG. 1.

Method ii.—Use of Brianchon's Theorem.

If a hexagon (see auxiliary figure) circumscribes a conic—for example, the hexagon ABCDEF—then its three diagonals AD, BE, CF are concurrent. We are given four tangents to the parabola, and we know also that the line at infinity touches the parabola—that is, we have 5 tangents.

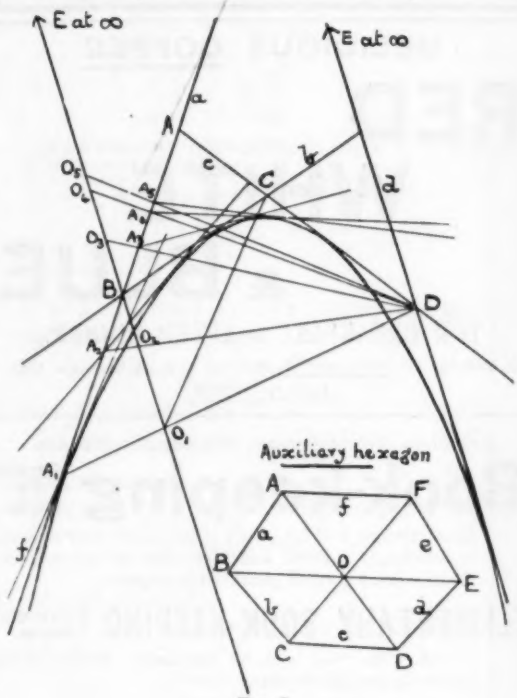

FIG. 2.

Consider a, b, c, d and the line at infinity e as 5 sides of a circumscribing hexagon, and let these intersect at B, C, D. The point E is at infinity on the line d, hence the diagonal BE is a line through B parallel to the line d. Draw this line, then for any circumscribing hexagon $abcdef$ the

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Brianchon point O lies on this line. Take any point A_1 on a for the intersection (a, f), and join A_1D. This meets the line BE at O_1. Hence F lies on CO_1, but F lies on e—that is, is at infinity; hence A_1F or f is parallel to CO_1. Draw A_1F parallel to CO_1, and we have constructed a tangent to the parabola. Repeat this process. It is not necessary to join CO_n each time; place the set-square along the join CO_n, and hence, as usual, draw a parallel to it through A_n. We show a number of tangents in the figure.

P.S.—I have not read Pickford's book very carefully, and have not got it with me at present. I will write to you about it later on.

Winslow.—Obtain the integrals

$$\int \frac{dx}{x\sqrt{a^n + x^n}}; \quad \int \frac{1-x}{1+x} \cdot \frac{dx}{\sqrt{x + x^2 + x^3}}.$$

Edwards's *Integral Calculus.*

(i.) Let $x^n = a^n \tan^2\theta$,

then $nx^{n-1} \cdot dx = 2a^n \tan\theta \sec^2\theta \cdot d\theta$;

thus
$$\int \frac{dx}{x\sqrt{a^n + x^n}} = \int \frac{1}{x \cdot a^{\frac{n}{2}} \sec\theta} \cdot \frac{2a^n \tan\theta \cdot \sec^2\theta d\theta}{nx^{n-1}}$$

$$= \int \frac{2a^n \tan\theta \cdot \sec\theta \cdot d\theta}{na^{\frac{n}{2}} \cdot x^n}$$

$$= \int \frac{2a^n \tan\theta \cdot \sec\theta \cdot d\theta}{n \cdot a^{\frac{n}{2}} \cdot a^n \tan^2\theta}$$

$$= \frac{2}{na^{\frac{n}{2}}} \int \frac{d\theta}{\sin\theta} = \frac{2}{na^{\frac{n}{2}}} \log \tan\frac{\theta}{2}.$$

But
$$\tan\theta = \frac{x^{\frac{n}{2}}}{a^{\frac{n}{2}}}.$$

$$\therefore \quad \frac{2\tan\frac{\theta}{2}}{1 - \tan^2\frac{\theta}{2}} = \frac{x^{\frac{n}{2}}}{a^{\frac{n}{2}}}.$$

$$\therefore \quad x^{\frac{n}{2}} \tan^2\frac{\theta}{2} + 2a^{\frac{n}{2}} \tan\frac{\theta}{2} - x^{\frac{n}{2}} = 0.$$

$$\therefore \quad \tan\frac{\theta}{2} = \frac{\sqrt{a^n + x^n} - a^{\frac{n}{2}}}{x^{\frac{n}{2}}};$$

and consequently the required integral is

$$\frac{2}{na^{\frac{n}{2}}} \log \frac{\sqrt{a^n + x^n} - a^{\frac{n}{2}}}{x^{\frac{n}{2}}}.$$

(ii.)
$$\int \frac{1-x}{1+x} \cdot \frac{dx}{\sqrt{x + x^2 + x^3}}.$$

Here put
$$y = \frac{\sqrt{1 + x + x^2}}{\sqrt{x}},$$

hence
$$\frac{dy}{dx} = \frac{\sqrt{x} \cdot \frac{1 + 2x}{2\sqrt{1 + x + x^2}} - \sqrt{1 + x + x^2} \cdot \frac{1}{2\sqrt{x}}}{x}$$

$$= \frac{x^2 - 1}{2x\sqrt{x + x^2 + x^3}}.$$

Thus the integral becomes

$$\int \frac{1-x}{1+x} \cdot \frac{1}{\sqrt{x + x^2 + x^3}} \cdot \frac{2x\sqrt{x + x^2 + x^3}}{x^2 - 1} \cdot dy$$

$$= -\int \frac{2x dy}{1 + 2x + x^2}.$$

But
$$y^2 = \frac{1 + x + x^2}{x},$$

hence
$$y^2 + 1 = \frac{1 + 2x + x^2}{x},$$

and the integral
$$= -\int \frac{2dy}{y^2 + 1}$$

$$= -2\tan^{-1} y$$

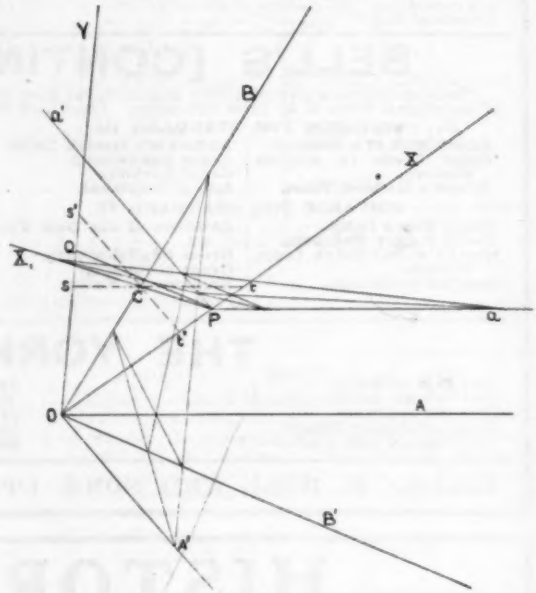
$$= -2\tan^{-1}\sqrt{\frac{1 + x + x^2}{x}}.$$

Gleorun.—OX, OY are two axes inclined at an angle of 50°; an hyperbola touches OX at a point P distant 9 cm. from O, and OY at the point Q distant 8 cm. from O. The hyperbola has an asymptote in the direction OA, where the angle AOX is 35° and AOY is 85°. Construct the centre of the hyperbola.

London B.Sc., 1909.

The straight line joining O to the mid-point of PQ is a diameter of the hyperbola. Draw this line OB; thus the centre C lies on OB. Also OB and PQ are conjugate lines of the hyperbola.

Draw OB′ parallel to PQ, then since the asymptotes are harmonic conjugates of pairs of conjugate diameters, the other asymptote is parallel to OA′ where OA′ is the harmonic conjugate of OA with respect to OB . OB′.



The construction for OA′ is shown in the figure, the harmonic property of a complete quadrilateral being used.

Again, if the asymptotes meet the tangent OP at tt', then $Pt = Pt'$, and consequently C being the centre, ct, ct' are harmonic conjugates of CP and a parallel through C to OP. Hence if Pa be parallel to OA, Pa′ to OA′, we know that PC is the harmonic conjugate of PX with respect to Pa and Pa′. Construct this harmonic conjugate and let it meet OB at C. C is the required centre.

The positions of the asymptotes st, $s't'$ are shown in the figure.

Whetley Lane.—Twelve cards are marked A, B, C, D, E, F, a, b, c, d, e, f, and are put into a bag; a man takes out two cards and puts them back; again he takes out two cards and puts them back; he then takes out two cards. In how many ways can he do this consistently with taking out a large and a small letter each time, and with taking F, f at least once.

(Board of Education, Stage III., 1893.)

Excluding the pair F, f, he can draw a pair, one big and one small, in $36 - 1 = 35$ ways.

(*a*) *Suppose he draws* F, f *only once.* He can do this at the first, second, or third draw. He can select two at the other two draws in 35 ways.

Combining these, the total is $3 \times 35 \times 35 = 3675$.

(*b*) *Suppose he draws* F, f *twice.* He can do this at the first and second, first and third, or second and third draws—namely, 3 ways. The other draw gives him 35 variations.

Total under this head, $3 \times 35 = 105$.

(*c*) *Suppose he draws* F, f *three times*—namely, in one way.

Final total $= 3675 + 105 + 1 = 3781$.

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